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ABSTRACT

This five-volume report details an effort undertaken by Ingersoll-Rand (IR) to restore a professional tool plant in Athens, Pennsylvania, as a viable asset to the IR corporation. Volume 1, the final report, presents a historical perspective of the Athens plant, discusses the major skill and knowledge issues facing the plant, and provides the strategic plan developed to address the issues. In addition, it describes the methodology used in the strategic needs assessment, provides the findings gathered from the self-assessment, and makes suggestions for post-assessment training and education programs. Volumes 2 and 3 contain the compilation of the machine and job classification task and knowledge inventories. Volume 2 matches tasks with jobs and jobs with departments; classifies machines by departments; associates tasks with each machine; and identifies procedural, technical, general, and systems knowledge associated with each machine. Volume 3 identifies general, systems, technical, and procedural knowledge associated with each task. Volume 4 provides sample database sorts from the database developed during the project. The sorts include jobs in various departments; tasks that jobs require; tasks that require specified general, systems, technical, and procedural knowledge; and machines that require specified general, systems, and procedural knowledge. Volume 5 contains the compilation of the self-assessment results and the instruments. (YLB)

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Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

Volumes 1-5

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August 1987

Institute for Research in Training and Development

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The Pennsylvania State University

Division of Counseling and Educational Psychology
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Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

August 1987

Volume 1

Final Report

The Pennsylvania State University

Division of Counseling and Educational Psychology
and Career Studies

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INTRODUCTION

Historically, the management of heavy manufacturing industries have faced the dilemma of whether to alter or abandon their firm's manufacturing processes as they are confronted with technological advances and changes in demand for their product. The demise of the United States steel industry is a prime example of how profits can dwindle when customers are able to obtain a product at a lower cost from overseas competitors that employ modernized, cost-effective manufacturing processes. The abandoned steel mills are a omnipresent reminder of this harsh reality.

Not one to be sentenced to the "steel graveyard," Ingersoll-Rand (IR), a firm specializing in the manufacturing of professional compressor tools, has aggressively undertaken efforts to offset the devastating results of inefficient, costly production. Its 1985 annual report reminded stockholders that:

> "The implementation of plans that improve productivity is a key management responsibility, one which we continue to stress. In this effort, our single most important asset is our 35,000 employees working together to maintain a strong, responsive organization, dedicated to quality products and profitable performance. Management's thrust is to find ways to help channel these employees' efforts without overly complicating how we operate."

Given this charge, IR focused on one of their professional tool manufacturing plants located in Athens, Pennsylvania. The remainder of this report will detail one part of the effort undertaken to restore this professional tool plant as a viable asset to the IR corporation. This part involved the Penn State University working with IR to carry out a needs assessment for training.

This report contains 5 major sections. First, a historical perspective of the Athens plant is presented. Second, the major skills and knowledge issues facing the plant are discussed. Third, the strategic plan developed to address the issues is provided. Also included in this section is the rationale for involving expertise of the Penn State Team. Following this dicussion, the fourth section provides the methodology employed to accomplish each phase of the strategic needs assessment. The fifth section contains the findings gathered from the self assessment as well as suggestions for post-assessment training and education programs.

HISTORICAL PERSPECTIVE

In 1967, the IR-Athen's plant was the major employer (1,800 workers) in the community and, as a result, served as the hub of economic and social activity. Over the years, however, market conditions, internal business decisions and technological advances had served to reduce the work force by approximately 80% and place the plant in jeopardy of being completely shut down. Thus, IR saw the need to examine their Athen's plant processes and determine if the plant could be salvaged back to economic health. The resulting decisions was to restructure the manufacturing process from its present linear model to one incorporating a cell model. It was reasoned that such a change would streamline production and allow IR to compete strategically in its professional tool market.

ISSUES

Such a restructure extended beyond moving machines and equipment. IR planned to replace outdated machinery with state-of-the-art equipment that was designed to reduce the manufacturing time and degree of error. In addition, IR faced two major issues concerning their work force: 1) what new knowledge/skills/expertise would be required of the work force entering the new cells, and 2) what is the work force's current knowledge/

skills/expertise? By comparing what the IR workers presently can do with what they will be required to do, then IR could determine the degree of training needed to prepare their workers for the new cellular manufacturing technology.

STRATEGIC PLAN

During the February of 1987, IR arranged, through Pennsylvania's Ben Franklin Job Partnership Program, to solicit the expertise of The Pennsylvania State University Vocational Industrial Educational Department. As a result, a team, comprising of Dr. Gary Geroy, Assistant Professor of Vocational Industrial Education and Director of the Institute for Research in Training and Development, and 4 graduate students, Sandra Dingle, George Ebert, N. Minx Olsen and Michael Erwin, was hired to investigate and address the training needs of the IR work force with respect to the new cell manufacturing process model. (In the remainder of this discussion, these individuals will be referred to as the Penn State Team).

This investigation necessitated a comprehensive needs assessment operation. This operation consisted of 8 assessment phases, followed by an anaysis and synthesis of the findings. The following are the type of information which were essential to the assessment:

1. Basic skill competencies (mathematics, reading, writing) of the entire IR work force (this included laid off personnel).
2. Work tasks associated with each present job classification in the manufacturing process.
3. Supporting knowledge (procedural, technical, general, systems) associated with each task in #2.

4. Work tasks associated with the operation of each machine presently located in the shop.
5. Work tasks associated with the operation of the "future" machines which will be placed in the cells.
6. Supporting knowledge (procedural, technical, general and systems) associated with each task in #4 and #5.
7. The frequency which workers perform the tasks identified in #2 and #4 in their current jobs.
8. The competency with which the worker felt they could perform the items in #2, #4, and #5.

METHODOLOGY

The Penn State Team recognized that IR was not economically able to cease operations and production while the needs assessment activity was being conducted. As a result, the team was committed to work as unobtrusively as possible to avoid unnecessary work interruptions. Essential to achieving this end, was the support and assistance from the IR Human Resource Development (HRD) personnel. Permission and support was solicited from the IR HRD office by the Penn State Team for every phase of the needs assessment operation. As a result, the "united front" of the IR HRD group and the Penn State Team served to decrease the amount of worker skeptism and resistance that would normally confront external efforts.

Initially, 6 phases of the needs assessment operation were implemented simultaneously: the basic skills assessment, work tasks and associated knowledge for each job classification, and work tasks and associated knowledge for present and future machines. The following will describe the methodology involved with these phases.

Basic Skills Assessment

Overview

The assessment activity was conducted during a three day span (May 6 - 8, 1987). Employees were scheduled for assessment activities in approximately 10 minute increments. Initially, each employee met with a Penn State assessment team member for about five minutes to discuss the assessment activity. This was done to reduce any test anxiety the employee may have been experiencing, as well as to answer any questions that they had about the assessment. After this five minute interaction, the employees' word recognition level was evaluated. With this information, the assessment team member was able to compile an assessment package that was tailored to each individual's abilities. The employees then responded to the assessment material in a separate examination area.

Instrumentation

The Wide Range Achievement Test (WRAT) was used to assess the employees' word recognition ability and math performance. The word recognition assessment was administered first so that evaluators could give the employees evaluation material that was commensurate with their abilities. The math segment of the WRAT was also administered to all the employees as per the WRAT instruction. Employees were given 10 minutes to complete this test.

The Adult Basic Level of Education Test (ABLE) was used to evaluate the employees' reading skills. The evaluators used the WRAT results to determine which one of the three levels of this instrument to administer. Level I indicated a reading ability from grades 0 to 4, Level II indicated reading skills from grades 5-8, and Level III indicated from grades 9-12.

Language was assessed using a language sub-test extracted from the Adult Proficiency Level (APL) test. Consisting of eight carefully selected items, it measured the employees' ability to complete forms and lists. Because of their demonstrated inability to comprehend reading material beyond fourth grade level, persons achieving a Level I reading score were not given the language sub-test.

Results

The results of the basic skill assessment activity are organized in the following manner. Initially, a global view of the basic skill performance of both current Ingersoll-Rand employees and furloughed workers is presented. In the subsequent section, the performance results for both groups are compared.

Numerical values that appear in the tables and charts on the following pages reflect the individual approach of this basic skill assessment. This is because not all employees completed an assessment instrument in each of the three academic areas. Consequently, the totals in these tables may differ from the overall number of employees evaluated.

Overall Performance

Many of the Ingersoll-Rand employees performed well in the assessment activity. Over half of all the workers in the plant and those on lay-off have adequate skills in all areas and require no basic skill remediation should they elect to bid into a job in one of the new cells. Only 2% of Ingersoll-Rand's work force require extensive remediation.

The following table presents more detailed data regarding the performance results for all persons evaluated at the Ingersoll-Rand plant.

	Basic Skill Proficiency Level Math	Basic Skill Proficiency Level Reading	Basic Skill Proficiency Level Language	Number of Persons	Percent
Category 1 Adequate Skills in Math, Reading, and Language	3	3	3	194	50.5
Category 2 Adequate Reading and Writing Skills but Limited Math Skills	1 or 2	3	3	128	33.3
Category 3 Limited Reading and Math Skills	1 2 2	2 1 2	N/A* N/A* N/A*	44	11.5
Category 4 Adequate Math Skills with Limited Reading and Language Skills	3	1 or 2	N/A*	11	2.9
Category 5 No Functional Reading Skills and Very Limited Math Skills	1	1	N/A*	7	1.8

*These values are not listed because language assessmets were not administered to those persons below a fifth grade reading level (Level I).

In the following, a brief discussion is presented which outlines the results by academic area for all persons evaluated during the assessment.

Reading

The majority of the Ingersoll Rand work force have sufficient reading skills for the work place. They are reading at or above the ninth grade level. At that level, people can read and comprehend most all manuals and written material they encounter on the job. Sixty-three employees were found to have either marginal or no functional reading skills. Fifty-four of these persons have reading abilities anywhere from fifth through eighth grade. These persons can read newspapers and simple manuals, but will have difficulty reading many of the complex manuals found in the plant. Nine persons were found to have no functional reading skills.

The following table illustrates the preceding information.

Reading Level of Ingersoll Rand Employees

Reading Level	Approximate Grade Level	Number of Workers
I	0-4	9
II	5-8	54
III	9-12	322

Math

The results of the math assessment were organized into three distinct levels with one of these levels branching off into a series of two performance levels. This was done to accurately contrast the needs of Ingersoll Rand with the skills of their employees. The following chart illustrates this breakdown.

Level	Concepts Mastered	Number of Employees	% of Work Force
I	Simple addition, subtraction, multiplication, and division	14	3.6%
II	Complex addition, subtraction, multiplication, division, simple fraction and decimals	166	43.3%
III	a. Complex addition, subtraction, multiplication, division, complex fractions and decimals, basics of algebra and geometry	184	47.9%
	b. Complex addition, subtraction, multiplication, division, complex fractions and decimals, algebra, geometry, and basics of trigonometry	20	5.2%

Language

Based upon the results of the APL sub-test, virtually all employees who have at least moderate reading skills have demonstrated sufficient writing skills for the work place. As mentioned in the instrumentation discussion, those with no functional reading skills were not given this exam because of their inability to comprehend the items.

Employees with a skill level of two or higher have adequate skills for their jobs at Ingersoll Rand.

The following chart illustrates the results of the language assessment:

Skill Level	Number of Workers	% of Work Force
I (Little Skill)	1	.2
II (Moderate Skills)	81	22.8
III (Skilled)	273	77

Results of Furloughed Employees and Current Employees

There appears to be little difference in reading skill levels between those workers on lay-off and current employees. The following table illustrates this concept.

Reading Skill Levels of Furloughed and Current Workers

Reading Skill Level	Furloughed Workers		Current Employees	
	Number	%	Number	%
1	0	0	8	2.4
2	7	17.9	46	13.9
3	32	82.1	277	83.7

Math skill levels are also very similar between these groups. The following table presents the results.

Math Skill Levels of Furloughed and Current Employees

Math Skill Level	Furloughed Workers		Current Employees	
	Number	%	Number	%
1	1	2.6	13	4
2	14	35.9	147	44.5
3	24	61.5	170	51.5

Language performance levelds are also very similar when examining the two groups. The following table presents this information.

Language Skill Level of Furloughed and Current Employees

Language Skill Level	Furloughed Workers		Current Employees	
	Number	%	Number	%
1	0	0	1	.3
2	8	20.5	72	21.8
3	31	79.5	229	69.2

Training Needs

Reading

Sixty-three employees were found to demonstrate a need for reading remediation. These individuals have reading levels anywhere from 0 to the 8th grade level. Nine of these persons were found to have no functional reading skills while the others had moderate reading ability.

To ensure the success of the training programs for Ingersoll Rand employees, the following specific guidelines for these programs should be followed:

1. Class size should be kept to a minimum (at the most 8-10 pupils/class).
2. Employees should take a diagnostic assessment at the onset of the training activity.
3. Individualized planned programs should be formulated for each trainee before instituting any coursework.
4. The trainees' length of stay in the training program should be mandated by degree of need. Workers must be permitted to remain in the training program only long enough to improve their skills to an acceptable level.

Based upon the training needs demonstrated by the Ingersoll Rand employees' performance on the basic skills assessment, the following is a recommended scope and content for the various levels of training programs:

1. At least one class should be organized for these persons with no functional reading ability (Level I readers). Approximately eight employees have been identified who require this programming. However, in all likelihood, many other workers who failed to participate in the assessment activity would also require this programming. Class size should be kept as small as possible. In addition, each employee should take a diagnostic test at the outset of the course and receive a subsequent planned course of study based on those results.
2. A number of classes should be offered to those workers who have moderate reading ability ranging from the 5th through 8th grade level (Level II). These workers need to improve their vocabulary, word identification skills, reading speed,

and (or) comprehension. Class size should be kept to a minimum and course content must conform to the individual needs of the worker.

Mathematics

1. One program should be offered that focuses on complex addition, subtraction, multiplication, and division. Fourteen Ingersoll Rand employees tested require this programming (Level I).
2. A course should be offered that teaches concepts involving fractions, decimals, and basics of algebra and geometry (Level II).
3. A training program should be offered to employees that deals with advanced algebra and geometry. In addition, the basics of trigonometry should also be introduced. The content of this program will enable workers to perform the majority of tasks in the plant.
4. An advanced program in trigonometry should also be offered to Ingersoll Rand employees. This course would interest a select group of employees who require trigonometry skills in satisfying their job demands.

Language

Based upon the results of the assessment, there is no need for language remediation programs at Ingersoll Rand. All workers who are literate possess acceptable skills.

Task and Knowledge Assessment

Overview

The Penn State Team sought information from two plant perspectives in order to ensure a thorough comprehensiveness in needs assessment data. One involved examining the work tasks and requisite knowledge associated with the particular job classification. The other involved looking at the work tasks and requisite knowledge from the perspective of operating the various shop machinery. Two Team members conducted the job classification assessment while another member was responsible for the machine-related data. Information from the two perspectives was gather via report-questionnaires followed by interviews.

Once all involved personnel were interviewed, the Team verified their findings by conducting additional follow-up interviews with workers not contacted previously. Following this verification process, the data from the two perspectives were cross-correlated in a further attempt to validate the findings.

This painstaking checking and re-checking of these findings was critical to the remainder of the operation since the prescribed training (if any) would focus on the particular tasks (and knowledge) which were found to be deficient.

Machine Operation Perspective

In the case of the machine-oriented perspective, floor supervisors and machine operators were first requested to complete a machine task and knowledge inventory report. An example of this report is contained on the next page. This inventory required the itemization of each and every task a worker must complete in order to ensure a safe and effective operation of the machine. In addition, once the tasks were identified, the supervisor or machine operator assisted a Penn State Team member in determining the specific types of procedural, general, systems and technical knowledge that a worker required to complete each task.

For the purpose of this assessment operation, procedural knowledge was defined as the step-by-step procedures that a worker needed to follow to

MACHINE TASK INVENTORY

FAMILY ______________________

MACHINE______________________

OCCUPATIONAL CODES USING MACHINE: ______________________

ANALYST ______________________ Date ______________

APPROVED BY ______________________ Date______________

Describe what the machine is designed to do.

Describe the relationship to other machines.

List the functional tasks the worker must carry out to set-up this machine

List the functional tasks the workers must carry out to operate this machine.

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complete a particular task. Systems knowledge was described as the information a worker needed to diagnose malfunctions and perform adjustments to the machine in order to ensure proper operation. Technical knowledge was knowledge needed to understand the processes and functions being carried out while the task was being completed. Lastly, general knowledge was described as the types of general or basic skills a worker needed to successfully carry out the task.

Once the machine task inventory and required knowledge lists were compiled, the Penn State Team member reviewed the findings with a different supervisor or machine operator in order to ensure that the respective lists were complete.

Job Classification Perspective

The Penn State members initiated a discussion with supervisors or foremen by discussing the differences between IR's documented "job descriptions" and the true state of operations in the plant. It quickly became apparent that discrepancies existed between what tasks a worker actually performed and what the current job descriptions revealed. As a result, the IR supervisors and foremen agreed that a revision of the task inventory and job description was critical. The forms used to gather this information are contained in the following pages. As in the case with the machine perspective, the IR personnel also assisted in the identification of the procedural, systems, technical, general knowledge that were associated with each task. Again, the data was validated by soliciting input from other IR personnel not involved in the initial data gathering phase.

A data base was created to organize, manage and eventually sort this wealth of information upon request. Such inquiries as:

What jobs are in which department?

What tasks are required in which jobs?

CURRENT JOB CLASSIFICATION

page _____ of _____

JOB TITLE ____________________

OCCU. NO. ____________________

GRADE ____________________

TASK INVENTORY

Analyst ____________________

Validated by ____________________

Date ____________________

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced

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page _____ of _____

CURRENT JOB CLASSIFICATION

TASK ______________________

PROCEDURAL KNOWLEDGE

Analyst ______________________

Validated by ______________________

Date ______________________

JOB TITLE ______________________

OCCU. NO. ______________________

GRADE ______________________

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced

CURRENT JOB CLASSIFICATION

page ____ of ____

JOB TITLE ____________________

TASK ____________________

OCCU. NO. ____________________

SYSTEMS KNOWLEDGE

GRADE ____________________

Analyst ____________________

Validated by ____________________

Date ____________________

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced

CURRENT JOB CLASSIFICATION

page ____ of ____

TASK ______________________

JOB TITLE ______________________

OCCU. NO. ______________________

GRADE ______________________

TECHNICAL KNOWLEDGE

Analyst ______________________

Validated by ______________________

Date ______________________

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced

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CURRENT JOB CLASSIFICATION

page ____ of ____

JOB TITLE ____________________

OCCU. NO. ____________________

GRADE ____________________

GENERAL KNOWLEDGE

Analyst ____________________

Validated by ____________________

Date ____________________

LEVEL OF PROFECIENCY: E = entry; I = intermediate; A = advanced

What procedural knowledge is associated with what job? What machine?

What general knowledge is associated with what job? What machine?

What systems knowledge is associated with what job? What machine?

What technical knowledge is associated with what job? What machine?

What machines are in each department?

What machines are used in which job?

could be addressed easily. Volumes 2 and 3 contain the compilations of the machine and job classification task and knowledge inventories.

In addition to these "housekeeping" duties, the data base served to provided the task and knowledge requirements of the jobs of the newly configured cells. Thus, no matter how IR decided to organize the job cells, the data base could identify the corresponding task and knowledge necessary for designing training for workers who were involved in the cell. Volume 4 of this report provides samples of output of this nature.

Self Assessment

The final two phases of the needs assessment operation consisted of determining the frequency at which particular job tasks identified in the task inventory were performed by workers in their current jobs. In addition, the self assessment identified with what degree of competency workers felt they could do these tasks. Data for these two phases was gathered through the implementation of a "worker self assessment instrument." This instrument consisted of two identical lists of tasks and knowledge (generated from the previous assessment efforts) accompanied by questions addressing frequency and competency. Samples of these instruments can be found in Volume 5.

The Penn State Team and the IR HRD department concurred that the self assessment report was essential to completing the "whole picture" of the current state of the work or skills and abilities in the plant. The IR steering committee served as a pilot group as the self assessment instrument was being finalized. The involvement of the IR steering committee served two purposes: one, to validate the terminology of the tasks and knowledge listed in the instrument. Second, and perhaps more importantly, by experiencing the nature of the self assessment activity, the IR steering committee was then able to describe the experience to their fellow workers who would be involved with the process at a later date. It was hoped that this strategy would decrease the worker's feelings of uncertainty and anxiety which may interfere with their responses.

All IR workers were provided the opportunity to complete the self assessment instrument on August 3 and 4, 1987. During the activity they were briefed with directions to complete the computerized answer form and given an opportunity to review the two parts and raise any questions they may have had. Following this briefing, the workers were given unlimited time to complete the instrument.

The results from this activity were then organized to enable the Penn State Team to analyze the job task or corresponding knowledge areas for frequency and degree of confidence. For example, if tasks were found to be frequently performed with a high degree of confidence, this was sufficient to suggest that training was not need for these particular tasks. Likewise if a task was found to be performed infrequently, then the critical need for training was not substantiated. A review of Volume 5 will enable training designers to focus on bona fide area of training needs. Volume 5 contains the compilation of the self assessment results, accompanied by interpretation procedures.

Worker Self Assessment Findings and Recommendations for Training

Included here are the observations concerning the overall IR work force and descriptions of specific areas in need of training.

Observations

1. The analysis indicated a strong correlation between the frequency at which the workers applied basic math skills in their jobs, the high degree of confidence with which they used the math and the high levels of their performance on the Basic Skills Assessment.
2. The analysis indicated that in the various job task areas, there appears to be a larger resource of workers who report that they can do the task, than the number of workers currently responsible for these particular job tasks.
3. The analysis indicated that several machines and job operations are currently unique to the Tool Room. (These machines include the Cincinnati Monoset, Hobb Machine, Contour Saw, Jig Bore and Cam Grinder) As these machines are moved into the future cells, the number of qualified workers required to operate the machines may increase. The data indicates that only 4% of the current work force (CWF) report that they can operate the machines without assistance. Another 6% of the CWF indicate that they, if given assistance, could operate these machines. Additionally, 94% of the CWF indicated that they never operated these specialty machines.
4. Summary of worker's request for training:

Training Area	Machining Roster A		Non-Machining Roster B		Skilled Machining Roster C		Skilled Trades Roster D		Company Average	
	Responses									
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
1. Reading	30%	70%	31%	69%	33%	67%	27%	73%	30%	70%
2. Basic Math	50%	50%	50%	50%	30%	70%	38%	62%	42%	58%
3. Algebra	63%	37%	61%	39%	67%	33%	79%	21%	68%	32%

Training Area	Machining Roster A		Non-Machining Roster B		Skilled Machining Roster C		Skilled Trades Roster D		Company Average	
					Responses					
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
4. Trigonometry and Advanced Math	44%	55%	44%	56%	70%	30%	77%	23%	59%	41%
5. Blue Print Reading	43%	57%	51%	49%	23%	77%	54%	46%	43%	57%
6. Blue Print Drawing	28%	72%	36%	64%	53%	47%	50%	50%	42%	58%
7. Conventional Machine Operations	55%	45%	43%	57%	33%	67%	50%	50%	45%	55%
8. CNC Machine Operations	72%	28%	50%	50%	77%	23%	54%	46%	63%	37%
9. Machine Shop Practices	56%	44%	43%	57%	47%	53%	46%	54%	48%	52%
10. Quality Control Procedures	52%	48%	52%	48%	50%	50%	46%	54%	50%	50%

Training Areas

1. Reading WIP Forms

Data:

37% of the CWF reported to read the WIP form regularly in their jobs.

30% of the CWF reported to be able to read the WIP without assistance.

22% of the CWF indicated that they could read the WIP if given assistance.

Comment:

There appeared to be fewer workers who reported that they could read the WIP without assistance than the current number who are required to read and use the WIP form. In addition, 30% of the workers across all rosters expressed a need for assistance in overall reading.

2. Trigonometry

Data:

10% of the CWF report that they use trigonometry in their jobs.

14% of the CWF report that they can use trigonometry without assistance.

11% of the CWF report that they have not done this but could if given assistance.

Comment:

The lower numbers of workers who reported that they are able to use trigonometry suggest a need for training. This is also supported by the 59% of the CWF that reported they would want training in trigonometry and advanced mathematics.

3. **Read Complicated Drawings**

Data:

44% of CWF report that they read complicated drawings regularly in their job.

41% of CWF reported that they could do this without assistance.

22% of CWF indicated they could do this if given assistance.

Comment:

There are fewer workers who can perform this task without assistance than the number who are responsible for doing this task. Additionally, this correlates with the fact that 50% of the workers, across all rosters, express a desire for blue print reading instruction.

4. **Loading the Tape and Programming the CNC Machines**

Data:

20% of the CWF perform this task on a fairly regular basis.

28% of the CWF report that they can do this task without assistance.

12% of the CWF report that they can do this task if given assistance.

Comment:

Due to the next generation of technology which will become an integral part of the future cells, training in this area is anticipated to be critical.

5. **Set Up and Operate Grinders**

Data:

90% of the CWF report that they have never done this task.

Comment:

Although this task is currently described as low frequency (3% of CWF perform this), across all job classifications, it is anticipated that these tasks will be spread amongst all future manufacturing cells. This suggests that there will be a need for a greater number of workers who can carry out this task. In addition, this is also correlated with the fact that 50% of workers across all rosters requested training in conventional machine operations.

Additional Suggested Training Courses

The Penn State Team recommends that over the next 12 months, IR should develop the following courses with the suggested content:

1. Individualized Reading Workshop

   We suggest that this course be developed to help these people who need to build confidence in their reading skills. Each learner should work at his or her own pace on specific problem areas.

2. Reading Effectiveness

   We suggest that this course be developed to cover methods of increasing reading speed and comprehension.

3. Math Refresher I

   We suggest that this course be developed to help review for more advanced math courses. It should cover addition, subtraction, multiplication and division of whole numbers and decimals. The learners should be able to work at his or her own pace.

4. Math Refresher II

   We suggested that this course be developed as a continuation of Math Refresher I. Whole numbers should be used again to review decimals, fractions and percents. The learner could take one or both of these courses (depending upon his or her needs). It should not be required that learners take Math Refresher I before this course.

5. Shop Math

   We suggest that this course be developed to cover shop constants and math related to threads. A study should be made of speeds and feeds, square roots and math related to tapers.

6. Algebra

   We suggest that this course be developed to teach the basic skills in algebra. It should cover the use of algebraic equations, inequalities, and linear equations. These skills should be applied to word problems.

7. Geometry

   We suggest that this course be developed to introduce the basic skills of geometry. It should include methods of discovery and proof, angle relationships, lines and planes, and conquent triangles.

8. General Math

   We suggest that this course be developed to take up where the Math Refresher courses left off. It should expand on fractions, decimals, percents, ratio proportion and measurements. Pre-algebra skills should also be introduced.

9. Trigonometry

   We suggest that this course be developed to cover right triangles, trigonometric ratios, vectors, applied geometric problems, identities and interpolations, sine wave analysis, and complex numbers.

10. Blue Print Reading

We suggest that this course be developed to teach the interpretation of technical drawings. Topics which should be included are working drawings, hidden lines, angular surfaces, scales, circular feature, break lines and sectional views.

11. Machine Shop Practice

We suggest that this course be developed to cover milling, grinding, drilling, lathe and tool room measuring instruments. The learners should gain practical experience in feeds, speeds, and the use of various cutting tools.

12. Numeric Control

We suggest that this course be developed to cover the fundamentals of tape preparation and tape operation for machine shop equipment. This should also include the set up and operation of CNC equipment specific to IR.

13. Geometric Dimensions

We suggest that this course be developed to teach machine tool processing with an emphasis on controls imposed by geometric dimensioning. The course should include flatness, straightness, roundness, cylindricity, parallelism, perpendicularity, angularity, runout, profiles, concentricity, symmetry and true position.

14. Inspection and Gaging

We suggest that this course be developed to teach the use of mechanical inspection equipment. This should include calibration, micrometers, calipers, indicators, fixed-thread-ID and OD gauging, angular and optical measurement, surface place and accessories, and coordinate measuring.

Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

August 1987

Volume 2

Section I - VII

Machines

The Pennsylvania State University

Division of Counseling and Educational Psychology
and Career Studies

SECTION I

DEPARTMENTS AND JOBS

Which jobs are in each department?

Which tasks go with each job?

File: DEPART JOB
Report: GEROY

Dept: PRECISION MACHINING CENTER

Job: OPERATOR, LABOR GRADE: 4
Operate Seiki Automatic Turret Lathe
Operate Standard End Plate Finishing Lathe
Operate Drill Press
Operate Bridgeport Milling Machine

Dept: PRECISION MACHINING CENTER

Job: SET UP PERSONNEL, LABOR GRADE: 2
Set up Seiki Automatic Turret Lathe
Operate Seiki Automatic Turret Lathe
Set up Standard End Plate Finishing Lathe
Operate Standard End Plate Finishing Lathe
Set Up Drill Press
Operate Drill Press
Set Up Bridgeport Milling Machine
Operate Bridgeport Milling Machine

Dept: HONING MACHINES

Job: HONING MACHINE OPERATOR, LABOR GRADE: 6
Set up Sunnen Horizontal Hone
Operate Sunnen Horizontal Hone

Dept: TOOL ROOM

Job: CRIB KEEPER, LABOR GRADE: 6
Maintain Crib service
Maintain inventory of tools

```
File:   DEPART JOB
Report: GEROY

Dept: TOOL ROOM

Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4
Operate Cincinnati Monoset Tool Grinder
Operate KO Surface Grinder
Operate Heald Tool Grinding Machine(s)
Operate Norton Surface Grinder
Operate Drill Grinder
Operate Surface Grinder
Operate Hobb Machine
Operate Cutter and Tool Grinding Machine
Operate Tap Grinder
**CONTINUED BELOW*****
Dept: TOOL ROOM

Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4
***CONTINUED FROM ABOVE***
Operate Thread Chaser
Operate Gleason Cutter-Shaper
Operate Single-Point Carbide Grinder




Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 3
Operate Cincinnati Monosett Tool Grinder
Operate KO Surface Grinder
Operate Heald Tool Grinding Machine(s)
Operate Norton Surface Grinder
Operate Drill Grinder
Operate Surface Grinder
Operate Hobb Machine
Operate Cutter and Tool Grinding Machine
Operate Tap Grinder
****CONTINUED BELOW****
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 3
***CONTINUED FROM ABOVE****
Operate Thread Chaser
Operate Broach Grinder
Operate Gleason Cutter-Shaper
Operate Single Point Carbide Grinder
Operate Sunnen Precision Honing Machine
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File:   DEPART JOB
Report: GEROY

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 4
Operate Cincinnati Monosett Tool Grinder
Operate KO Surface Grinder
Operate Heald Tool Grinding Machine(s)
Operate Norton Surface Grinder
Operate Drill Grinder
Operate Surface Grinder
Operate Hobb Machine
Operate Cutter and Tool Grinding Machine
Operate Tap Grinder
****CONTINUED BELOW*****
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 4
*****CONTINUED FROM ABOVE******
Operate Thread Chaser
Operate Broach Grinder
Operate Gleason Cutter Shaper
Operate Single Point Carbide Grinder
Operate Sunnen Precision Honing Machine



Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 6
Operate Cincinnati Monosett Tool Grinder
Operate KO Surface Grinder
Operate Heald Tool Grinding Machine(s)
Operate Norton Surface Grinder
Operate Drill Grinder
Operate Surface Grinder
Operate Hobb Machine
Operate Cutter and Tool Grinding Machine
Operate Tap Grinder
****CONTINUED BELOW****
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 6
*****CONTINUED FROM ABOVE*****
Operate Thread Chaser
Operate Broach Grinder
Operate Gleason Cutter-Shaper
Operate Single Point Carbide Grinder
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```
File:   DEPART JOB
Report: GEROY

Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 8
Operate Cincinnati Monosett Tool Grinder
Operate KO Surface Grinder
Operate Heald Tool Grinding Machine(s)
Operate Norton Surface Grinder
Operate Drill Grinder
Operate Surface Grinder
Operate Hobb Machine
Operate Cutter and Tool Grinding Machine
Operate Tap Grinder
****CONTINUED BELOW****
Dept: TOOL ROOM

Job: GRINDER-TOOL, LABOR GRADE: 8
****CONTINUED FROM ABOVE*****
Operate Thread Chaser
Operate Broach Grinder
Operate Gleason Cutter-Shaper




Dept: TOOL ROOM

Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5
Operate Drill Press
Operate Milling Machine(s)
Operate Lathe
Operate Jig Bore
Operate Surface Grinder
Operate Bench Grinders
Operate Contour Saw


Dept: TOOL ROOM

Job: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6
Operate Drill Press
Operate Milling Machine(s)
Operate Lathe
Operate Jig Bore
Operate Surface Grinder
Operate Bench Grinder
Operate Contour Saw
```

File: DEPART JOB
Report: GEROY

Dept: TOOL ROOM

Job: TOOL AND DIE MAKER, LABOR GRADE: 3
Operate Drill Press
Operate Milling Machine(s)
Operate Lathe
Operate Vertical Shaper
Operate Jig Bore
Operate Surface Grinder
Operate Cam Grinder
Operate Jig Grinder

Dept: TOOL ROOM

Job: TOOL AND DIE MAKER, LABOR GRADE 1
Operate Drill Press
Operate Milling Machine(s)
Operate Lathe
Operate Jig Bore
Operate Surface Grinder
Operate Jig Grinder
Operate Vertical Shaper
Operate Cam Grinder

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4
Set up Landis External Grinder
Operate Landis External Grinder
Set up Norton External Grinder
Operate Norton External Grinder

Dept: GRINDING DEPARTMENT

Job: DOUBLE DISK GRINDER OPERATOR, LABOR GRADE: 4
Set up Gardner Disk Grinder Horizontal
Operate Gardner Disk Grinder Horizontal

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File:   DEPART JOB
Report: GEROY

Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR CENTERLESS, LABOR GRADE: 4
Set up Cincinnati Thru Feed Grinder
Operate Cincinnati Thru Feed Grinder
Set up Landis Plunge Drive Grinder
Operate Landis Plunge Drive Grinder




Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR INTERNAL, LABOR GRADE: 4
Set up Heald Model 271 Grinder
Operate Heald Model 271 Grinder
Set up Heald Model 272 Plain Grinder
Operate Heald Model 272 Plain Grinder
Set up Cincinnati Model 181 Grinder
Operate Cincinnati Model 181 Grinder
Set up Heald Model 272 Sizematic Grinder
Operate Heald Model 272 Sizematic Grinder


Dept: GRINDING DEPARTMENT

Job: EXTERNAL GRINDER, LABOR GRADE: 4
Set up External Stepmaster Grinder
Operate External Stepmaster Grinder




Dept: GRINDING DEPARTMENT

Job: GRINDER OPERATOR SURFACE, LABOR GRADE: 6
Set up Rotary Vertical Spindle
Operate Rotary Vertical Spindle
```

File: DEPART JOB
Report: GEROY

Dept: ASSEMBLY

Job: VOLUME ASSEMBLER, LABOR GRADE: 6
Assemble components for tools

Dept: ASSEMBLY

Job: ASSEMBLER, LABOR GRADE: 4
Assemble components for tools

Dept: ASSEMBLY

Job: INSPECTOR-TESTER VOLUME ASSEMBLY, LABOR GRADE: 2
Operate Robot Test Cell

Dept: BENCHWORK

Job: BENCH HAND, LABOR GRADE: 7
Stamp identification number on part
Operate Roll Stamp
Operate power press
Assemble two or more parts

File: DEPART JOB
Report: GEROY

Dept: BENCHWORK

Job: STAMPER HAND ROLL, LABOR GRADE: 8
Stamp identification number on parts
Operate Roll Stamp
Operate Power Press

Dept: J & L DEPARTMENT

Job: PRECISION BORING MACHINE (222) OPERATOR, GRADE: 4
Set up Standard Heald Borematic Machine
Operate a Standard Heald Borematic Machine

Dept: J & L DEPARTMENT

Job: PRECISION BORING MACHINE (324-A) OPER., GRADE: 4
Set up Heald Borematic Pin Machine
Operate Heald Borematic Pin Machine

Dept: J & L DEPARTMENT

Job: TURRET LATHE OPERATOR, LABOR GRADE: 2
Set up horizontal turret lathe(s)

File: DEPART JOB
Report: GEROY

Dept: J & L DEPARTMENT

Job: TURRET LATHE OPERATOR. LABOR GRADE: 4
Operate horizontal turret lathe(s)

Dept: TRANSFER LINE

Job: TRANSFER.LINE OPERATOR, LABOR GRADE: 2
Set up Transfer Machine
Operate Transfer Machine
Set up for J & L ATL
Operate J & L ATL
Set up MSO Machine
Operate MSO Machine

Dept: HEAT TREAT

Job: FURNACE OPERATOR/LEADER, LABOR GRADE: 3
Operate furnace

Dept: HEAT TREAT

Job: FURNACE OPERATOR, LABOR GRADE: 4
Operate furnace

```
File:   DEPART JOB
Report: GEROY

Dept: HEAT TREAT

Job: FINISHER-CLASS 1, LABOR GRADE: 4
Operate Wheel & Braden Shot-Blast Machine
Operate Black Oxide Line
Operate Straightening Press
Operate Lapping Machine




Dept: HEAT TREAT

Job: BLACKSMITH, LABOR GRADE: 3
Operate Forge Furnace
Operate Upset Hammer
Operate Richard's Bender




Dept: POTTER & JOHNSON

Job: OPERATOR, LABOR GRADE: 4
Operate Seiki Model NE CNC Lathe
Operate Seiki Model NEA CNC Lathe
Operate Warner Swazy AC Lathes




Dept: POTTER & JOHNSON

Job: OPERATOR, LABOR GRADE: 6
Set up Potter & Johnson Chucking Lathe(s)
Operate Potter & Johnson Chucking Lathe(s)
```

File: DEPART JOB
Report: GEROY

Dept: POTTER & JOHNSON

Job: SET UP PERSONNEL, LABOR GRADE: 2
Set up Seiki Model NE CNC Lathe
Operate Seiki Model NE CNC Lathe
Set up Seiki Model NEA CNC Lathe
Operate Seiki Model NEA CNC Lathe
Set up Warner Swazy AC Lathe

Dept: DRILLING MACHINE

Job: DRILL PRESS OPERATOR-SENSITIVE/GANG DRILL, LG: 6
Set up 4-6 Spindle Gang Drill
Operate 4-6 Spindle Gange Drill
Sharpen Drills

Bept: DRILLING MACHINE

Job: DRILLING MACHINE OPERATOR-HEAVY DUTY, LABOR GRADE: 5
Set up Heavy Duty Vertical Drilling Machine
Operate Heavy Duty Vertical Drilling Machine
Set up and operate Radial Drill Press
Set up NATCO Multi-Spindle Drill Press
Operate NATCO Multi-Spindle Drill Press
Set up and operate 24" Upright Single Spindle Drill Press

Dept: MILLING DEPARTMENT

Job:CNC MILLING MACHINE OPERATOR, LABOR GRADE 4
Operate an Okata CNC Milling Machine
Operate a Bridgeport CNC Milling Machine

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File:   DEPART JOB
Report: GEROY

Dept: MILLING DEPARTMENT

Job: CNC OKATA/BRIDGEPORT SETUP MAN, LABOR GRADE: 2
Set up CNC Okata Milling Machine
Operate CNC Okata Milling Machine
Set up CNC Bridgeport Milling Machine
Operate CNC Bridgeport Milling Machine




Dept: MILLING DEPARTMENT

Job: MILLING MACHINE OPERATOR, LABOR GRADE: 4
Set up Cincinnati Vertical Milling Machine
Operate Cincinnati Vertical Milling Machine
Set up Bridgeport Vertical Milling Machine
Operate Bridgeport Vertical Milling Machine
Set up Cincinnati Rise and Fall
Operate Cincinnati Rise and Fall
Set up Duplex-Twin Mill Machine



Dept: NC DEPARTMENT

Job: SET UP, LABOR GRADE: 2
Operate Milwaukee Matic EB
Operate J & L Align.
Operate CNC Combi-Lathe
Operate Kearny Treker 180 Indexes
Operate Scimmx Indexes
Operate Do All Saw
Operate A Lines Lathe



Dept: NC DEPARTMENT

Job: OPERATOR, LABOR GRADE: 4
Set Up Milwaukee Matic EB
Operate Milwaukee Matic EB
Set Up CNC Machine Lathe
Operate CNC Machine Lathe
Set Up Combi-Lathe
Operate Combi-Lathe
Set Up KT 180
Operate KT 180
Set Up Scimmx
****CONTINUED BELOW***
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File:   DEPART JOB
Report: GEROY

Dept: NC DEPARTMENT

Job: OPERATOR, LABOR GRADE: 4
*****CONTINUED FROM ABOVE*****
Operate Scimmx
Set Up Do All Saw
Operate Do All Saw
Set Up A Lines Lathe
Operate A Lines Lathe
Set Up Seiki Lathe(s)
Operate Seiki Lathe(s)


Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP & OPERATOR, LG: 2
Set up Wagner Saw
Operate Wagner Saw
Set up Barber Coleman Hobb-Gear Making Machine
Operate Barber Coleman Hobb-Gear Making Machine
Set up Anvill Mill
Operate Anvill Mill
Set up Vertical Broaches
Operate Vertical Broaches
Set up MSO Machine
*****CONTINUED BELOW******
Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 2
*****CONTINUED FROM ABOVE*****
Operate MSO Machine
Set up Burke Twin Mill Machine
Operate Burke Twin Mill Machine
Set up Seiki Turning Machine
Operate Vibro
Operate Overveck Grinder


Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4
Set up Wagner Saw
Operate Wagner Saw
Set up Barber Coleman Hobb-Gear Making Machine
Operate Barber Coleman Hobb-Gear Making Machine
Set up Anvill Mill
Operate Anvill Mill
Set up Vertical Broaches
Operate Vertical Broaches
Set up MSO Machine
******CONTINUED BELOW********
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```
File:   DEPART JOB
Report: GEROY

Dept: TURNING CENTER DEPARTMENT

Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4
*****CONTINUED FROM ABOVE*****
Operate MSO Machine
Set up Burke Twin Mill Machine
Operate Burke Twin Mill Machine
Operate Vibro
Operate Overbeck Grinder



Dept: SCREW MACHINE DEPARTMENT

Job: SET-UP MAN--GEAR SHAPER, LABOR GRADE: 2
Set up Gear Shaper
Operate Gear Shaper



Dept: SCREW MACHINE DEPARTMENT

Job: OPERATOR-GEAR SHAPER, LABOR GRADE: 8
Operate Gear Shaper



Dept: SCREW MACHINE DEPARTMENT

Job: SCREW MACHINE SETUP, LABOR GRADE: 2
Set up Multiple Spindle Screw Machines
Operate Multiple Spindle Screw Machines
Set up Automatic Spindle Screw Machine
Operate Automatic Spindle Screw Machine
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File: DEPART JOB
Report: GEROY

Dept: SCREW MACHINE DEPARTMENT

Job: SCREW MACHINE OPERATOR. LABOR GRADE: 6
Operate Multiple Spindle Screw Machines
Operate Automatic Screw Machines

Dept: SCREW MACHINE DEPARTMENT

Job: LATHE OPERATOR, LABOR GRADE: 6
Set up Engine Lathes
Operate Engine Lathes

Dept: POLISHING & POWDER COATING DEPARTMENT

Job: SPIN FINISH MACHINE OPERATOR, LABOR GRADE: 5
Operate Vibro

Dept: POLISHING AND POWDER COATING DEPARTMENT

Job: POWDER COATING, LABOR GRADE: 5
Operate Spray Guns
Operate Powder Coating Room

File: DEPART JOB
Report: GEROY

Dept: POLISHING AND POWDER COATING DEPARTMENT

Job: VIBRO OPERATOR, LABOR GRADE: 5
Operate Vibro
Operate SWECO
Operate Barrel Machine Tumbler
Operate Big Wash
Operate Derust Wash

Dept: POLISHING & POWDER COATING DEPARTMENT

Job: POLISHER/DEBURRER, LABOR GRADE: 5
Operate Buffing Lathe
Operate Die Grinder
Operate Disc Sander
Operate Belt Sander

SECTION II

MACHINES CLASSIFIED BY DEPARTMENT

What machines are in each department?

File: DEPT.MACH
Report: GEROY

DRILLING MACHINE

Heavy Duty Drilling Machine
Radial Drill Press
21" Upright Single Spindle Drill Press
NATCO Multi-Spindle Drill Press
Delta 6 Spindle Drill Press
Deltoff 12, 18, 36" Gun Drill
IR Gun Drill
Sanvik Ejector Drill (not machine- but part)

TRANSFER LINE

Transfer Line
Jones & Lamson
MSO
MSO 5 Station RTM

J & L DEPARTMENT

Standard Heald Borematic
Heald Borematic Pin Machine
Horizontal Turret Lathe
Heald Borematic Model 321

POTTER & JOHNSON

Seiki CNC NE Lathe
Seiki CNC NEA Lathe
Warner Swazy AC Lathe
Potter & Johnson Chucking Lathe

```
File:   DEPT.MACH
Report: GEROY

MILLING

Okata CNC Milling Machine
Bridgeport CNC Milling Machine
Cincinnati Horizontal Milling Machine
Bridgeport Horizontal Milling Machine
Cincinnati Rise & Fall
Duplex Twin Mill Machine
K & T Series E B Vertical w/NC Tape
K & T 1804 Axis w/ NC Tape
Cincinnati 720 3 Axis VMC w/NC Tape
******CONTINUED BELOW******

MILLING

******CONTINUED FROM ABOVE**********
K & T 1436 A Duplex Mill
Cincinnati 5 Horizontal Milling Machine
Cincinnati 2 Horizontal Milling Machine
Bridgeport Vertical Milling Machine
Schaffner Rise & Fall Milling Machine
Cincinnati 107/122 Rise & Fall Milling Machine
Bridgeport 4 Axis VMC w/CNC
Acroloc
Okata

POLISHING AND POWDERCOATING

Spin Finish
Vibro
SWECO
Barrel Machine Tumble
Big Wash
Derust Wash
Spray Guns (Paint Booth)
Powder Coating Room
Buffing Lathe
****CONTINUED BELOW*****

POLISHING AND POWDER COATING

*****CONTINUED FROM ABOVE*****
Die Grinder
Disc Sander
Beta Machine
Float Sander
Disc Grinder
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File:   DEPT.MACH
Report: GER01

GRIND

Cincinnati Monosett Tool Grinder
KO Surface Grinder
Drill Grinder
Surface Grinder
Tap Grinder
Single Point Carbide Grinder
Bench Grinder
Cam Grinder
Landis External Grinder
*****CONTINUED BELOW******

GRIND

****CONTINUED FROM ABOVE*****
Heald 271 Grinder
Heald Plain 222 Grinder
Heald Sizematic 272 Grinder
Cincinnati 181 Grinder
External Step Master
Overbeck
Die Grinder
Norton External Grinder
****CONTINUED BELOW****

GRIND

*****CONTINUED FROM ABOVE*****
Gardner Disk Grinder
Cincinnati Through Feed Grinder
Landis Plunge Drive Grinder
Norton Surface Grinder
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SECTION III

TASKS ASSOCIATED WITH EACH MACHINE

Which tasks are required by each machine?

File: MACH.TASK
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE
Set Up
Operate

RADIAL DRILL PRESS
Set Up
Operate

21" UPRIGHT SINGLE SPINDLE DRILL PRESS
Set Up
Operate

NATCO MULTI-SPINDLE DRILL PRESS
Set Up
Operate

TRANSFER LINE
Set Up
Operate

File: MACH.TASK
Report: GEROY

JONES & LAMSON ATL
Set Up
Operate

MULTI-SECONDARY
Set Up
Operate

MSO 5 STATION RTM
Set Up
Operate

9 STATION IN-LINE TRANSFER MACHINE
Set Up
Operate

STANDARD HEALD BOREMATIC MILLING MACHINE (MODEL 222)
Set Up
Operate

File: MACH.TASK
Report: GEROY

HEALD BOREMATIC PIN MACHINE (MODEL 324-A)
Set Up
Operate

HORIZONTAL TURRET LATHE
Set Up
Operate

SEIKI CNC NE LATHE
Set Up
Operate

SEIKI CNC NEA LATHE
Set Up
Operate

WARNER SWAZY AC LATHE
Set Up
Operate

File: MACH.TASK
Report: GEROY

POTTER & JOHNSON CHUCKING LATHE
Set Up
Operate

HEALD BOREMATIC MILLING MACHINE (MODEL 321-A)
Set Up
Operate

DELTA 6 SPINDLE DRILL PRESS
Beval
Drill
Ream
Bore
Tap

DELTOFF 12, 18, 36 GUN DRILLS
Sharpen drills

I.R. GUN DRILL
Sharpen drill

File: MACH.TASK
Report: GEROY

OKATA CNC MILLING MACHINE
Operate
Set up

BRIDGEPORT CNC MILLING MACHINE
Operate
Set up

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Operate
Set up

BRIDGEPORT VERTICAL MILLING MACHINE
Operate
Set up

CINCINNATI RISE & FALL
Operate
Set up

File: MACH.TASK
Report: GEROY

DUPLEX TWIN MILL MACHINE
Operate
Set up

K & T SERIES E B VERTICAL W/ NC TAPE
Operate
Set up

K & T 1804 AXIS W/ NC TAPE
Operate
Set up

CINCINNATI 720 3 AXIS VMC W/ NC TAPE
Operate
Set up

K & T 1436 A DUPLEX MILL
Operate
Set up

File: MACH.TASK
Report: GEROY

CINCINNATI 5 HORIZONTAL MILLING MACHINE
Operate
Set up

CINCINNATI 2 HORIZONTAL MILLING MACHINE
Operate
Set up

BRIDGEPORT VERTICAL MILLING MACHINE
Operate
Set up

SCHAFFNER RISE & FALL MILLING MACHINE
Operate
Set up

CINCINNATI 107/122 RISE & FALL MILLING MACHINE
Operate
Set up

File: MACH.TASK
Report: GEROY

BRIDGEPORT 4 AXIS VMC W/ CNC
Operate
Set up

ACROLOC 4 AXIS VMC W/CNC
Operate
Set up

OKATA VM 4 AXIS W/CNC
Operate
Set up

CINCINNATI MONOSETT TOOL GRINDER
Operate
Set up

KO SURFACE GRINDER
Operate
Set up

File: MACH.TASK
Report: GEROY

NORTON SURFACE GRINDER
Operate
Set up

DRILL GRINDER
Operate
Set up

SURFACE GRINDER
Operate
Set up

TAP GRINDER
Operate
Set up

SINGLE POINT CARBIDE GRINDER
Operate
Set up

File: MACH.TASK
Report: GEROY

BENCH GRINDER
Operate
Set up

CAM GRINDER
Operate
Set up

LANDIS EXTERNAL GRINDER
Operate
Set up

NORTON EXTERNAL GRINDER
Operate
Set up

GARDNER DISK GRINDER
Operate
Set up

File: MACH.TASK
Report: GEROY

CINCINNATI THROUGH FEED GRINDER
Operate
Set up

LANDIS PLUNGE DRIVE GRINDER
Operate
Set up

HEALD 271 GRINDER
Operate
Set up

HEALD PLAIN 222 GRINDER
Operate
Set up

HEALD SIZEMATIC 272 GRINDER
Operate
Set up

File: MACH.TASK
Report: GEROY

CINCINNATI 181 GRINDER
Operate
Set up

EXTERNAL STEP MASTER
Operate
Set up

OVERBECK
Operate
Set up

DIE GRINDER
Operate
Set up

SPIN FINISH
Operate

File: MACH.TASK
Report: GEROY

VIBRO
Operate

SWECO
Operate

BARREL MACHINE TUMBLER
Operate

BIG WASH
Operate

DERUST WASH
Operate

File: MACH.TASK
Report: GEROY

SPRAY GUNS (PAINT BOOTH)
Operate

POWDER COATING ROOM
Operate

BUFFING LATHE
Operate

DIE GRINDER
Operate

DISC SANDER
Operate

File: MACH.TASK
Report: GEROY

BETA MACHINE
Operate

FLOAT SANDER
Operate

DISC GRINDER
Operate

SECTION IV

PROCEDURAL KNOWLEDGE ASSOCIATED WITH EACH MACHINE

What procedural knowledge is required
by each machine?

File: MACH.PROCD
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE
Locate & obtain fixture, prints, WIP, gages, & tooling
Set up press
Run
Inspect
Adjust
Load/unload

RADIAL DRILL PRESS
Locate & obtain fixture, prints, WIP, gages, & tooling
Set up press
Run
Inspect
Adjust
Load/unload
Obtain drills
Obtain reamers
Set speeds
Fix tools

21" UPRIGHT SINGLE SPINDLE DRILL PRESS
Locate & obtain fixture, prints, WIP, gages, & tooling
Set up press
Run
Inspect
Adjust
Load/unload
Obtain drills
Obtain reamers
Set speeds
Fix tools

NATCO MULTI-SPINDLE DRILL PRESS
Locate & obtain fixture, prints, WIP, gages, & tooling
Set up press
Run
Inspect
Adjust
Load/unload
Obtain drills
Obtain reamers
Set speeds
Fix tools

```
File:   MACH.PROCD
Report: GEROY

TRANSFER LINE
Select & Obtain WIP & tools
Select & obtain WIP set up sheets
Preset drills
Adjust heads
Preset mill ends
Change Jaws and Jobs
Adjust brackets
Sharpen tools
Inspect (check part to print)
Adjust machine
Load/unload and run
Set tools
JONES & LAMSON
Select & obtain WIP & tooling
Select & obtain WIP set up sheets
Inspect (check part to print)
Load/unload
Set tools
Run




MSO MACHINE
Select & obtain WIP & tooling
Select & obtain WIP set up sheets
Inspect (check part to print)
Load/unload
Set tools
Run




MSO 5 STATION RTM
Select & obtain WIP & tooling
Select & obtain WIP set up sheets
Inspect (check part to print)
Adjust machine
Set tools
Run
```

File: MACH.PROCD
Report: GEROY

9 STATION IN-LINE TRANSFER MACHINE
Inspect (check part to print)
Adjust machine
Load/unload
Set tools
Run
Perform simple maintenance
Secure material in collet/fixture
Select/change collet/fixture

HEALD BOREMATIC MILLING MACHINE MODEL 222
Select/obtain WIP, tooling, gages, collet fixtures
Select/change index plate, drills, boring bars, reamers
Select/set feeds and speeds
Set stops/offsets
Adjust milling heads
Load/unload parts
Inspect (check part to print)
Adjust machine-- set switches
Perform simple maintenance
Select/change tool
Secure material in furnace
Grind/sharpen tools
HEALD BOREMATIC MILLING MACHINE MODEL 324-A
Select/obtain WIP, tooling, gages, collet fixtures
Select/change index plate, drills, boring bars, reamers
Select/set feeds and speeds
Set stops/offsets
Adjust milling heads
Load/unload parts
Inspect (check part to print)
Adjust machine-- set switches
Perform simple maintenance
Select/change tool
Secure material in furnace
Grind/sharpen tools
HORIZONTAL TURRET LATHE
Place tooling in proper sequence

```
File:   MACH.PROCD
Report: GEROY

SEIKI CNC NE LATHE
Select/obtain WIP, tooling, & gages
Select/obtain prints/set up sheets
Select/obtain tape control
Adjust/calibrate
Install tape
Load/unload parts
Inspect (check part to print)
Set tools
Perform simple maintenance
Secure material in fixture
Select/change collet/fixture

SEIKI CNC NEA LATHE
Select/obtain WIP, tooling, & gages
Select/obtain prints/set up sheets
Select/obtain tape control
Adjust/calibrate
Install tape
Load/unload parts
Inspect (check part to print)
Set tools
Perform simple maintenance
Secure material in fixture
Select/change collet/fixture

WARNER SWAZY AC LATHE
Select/obtain WIP, tooling, & gages
Select/obtain prints/set up sheets
Select/obtain tape control
Adjust/calibrate
Install tape
Load/unload parts
Inspect (check part to print)
Set tools
Perform simple maintenance
Secure material in fixture
Select/change collet/fixture

POTTER & JOHNSON CHUCKING LATHE
Select/obtain WIP, tooling, & gages
Select/obtain prints/set up sheets
Select/obtain tape control
Adjust/calibrate
Install tape
Load/unload parts
Inspect (check part to print)
Set tools
Perform simple maintenance
Secure material in fixture
Select/change collet/fixture
```

File: MACH.PROCD
Report: GEROY

HEALD BOREMATIC MILLING MACHINE MODEL 321-A
Select/obtain WIP, tooling, & gages
Select/change collet/fixture
Select/change index plate
Select/change drills
Select/set feeds
Select/set speeds
Set stops/offsets
Load/unload parts
Perform simple maintenance
Grind/sharpen tools

DELTA 6 SPINDLE DRILL PRESS
Locate/obtain WIP, blueprints
Locate/obtain tooling and gages
Locate/obtain fixtures
Fix tooling, gages, fixture
Set stops
Adjust
Inspect

DELTOFF 12, 18, 36 GUN DRILLS
Locate/obtain WIP, blueprints
Locate/obtain fixture
Inspect
Select/set speeds
Select/set feeds
Change/reset drills
Change bushings

I.R. GUN DRILLS
Locate/obtain prints and WIP
Locate/obtain fixture
Inspect
Select/set speeds
Select/set feeds
Change/reset drills
Change bushings
Load/unload parts

File: MACH.PROCD
Report: GEROY

SANVIK EJECTOR DRILL PART
Select/set speeds

OKATA CNC MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Load tape
Perform simple maintenance
Clear computer
Secure material

BRIDGEPORT CNC MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Clear computer
Load tape
Indicate fixture
Secure material
Perform simple maintenance

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds

```
File:   MACH.PROCD
Report: GEROY

BRIDGEPORT VERTICAL MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds



CINCINNATI RISE & FALL
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds



DUPLEX TWIN HEAD MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds



K & T SERIES E B VERTICAL W/ NC TAPE
Perform simple maintenance
Load tape
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds
```

File: MACH.PROCD
Report: GEROY

K & T 1804 AXIS W/ NC TAPE
Perform simple maintenance
Load tape
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds

CINCINNATI 7200 3 AXIS VMC W/ NC TAPE
Load tape
Perform simple maintenance
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds

K & T 1436 A DUPLEX MILLING MACHINE
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Secure materials
Adjust
Attach fixture/collet
Select feeds/ speeds
Set stops

CINCINNATI 5 HORIZONTAL MILLING MACHINE
Secure materials
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Set stops
Adjust
Attach fixture/collet
Select feeds/ speeds

File: MACH.PROCD
Report: GEROY

CINCINNATI 2 HORIZONTAL MILLING MACHINE
Secure materials
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Set stops
Adjust
Attach fixture/collet
Select feeds/ speeds

BRIDGEPORT VERTICAL MILLING MACHINE
Secure material
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Set stops
Adjust
Attach fixture/collet
Select feeds/ speeds

SCHAFFNER RISE & FALL MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds
Indicate fixture
Perform simple maintenance
Set stops

CINCINNATI 107/122 RISE & FALL MILLING MACHINE
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds
Set stops
Perform simple maintenance
Indicate fixture
Secure material

File: MACH.PROCD
Report: GEROY

BRIDGEPORT 4 AXIX VMC W/ CNC
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Indicate fixture
Load tape
Perform simple maintenance
Secure material

ACROLOC 4 AXIS VMC W/CNC
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds
Load tape
Secure material
Set stops

OKATA VM 4 AXIS W/CNC
Load/unload
Run (operate)
Inspect (check part to print)
Select/obtain WIP, tools, blueprints, tape
Preset/set tooling
Adjust
Attach fixture/collet
Select feeds/ speeds
Load tape
Secure material
Set stops

CINCINNATI MONOSETT TOOL GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

```
File:   MACH.PROCD
Report: GEROY

KO SURFACE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

DRILL GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

SURFACE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

TAP GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine
```

```
File:   MACH.PROCD
Report: GEROY

SINGLE POINT CARBIDE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

BENCH GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

CAM GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

LANDIS EXTERNAL GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine
```

```
File:   MACH.PROCD
Report: GEROY

HEALD 271 GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

HEALD PLAIN 222 GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

HEALD SIZEMATIC 272 GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

EXTERNAL STEP MASTER GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine
```

```
File:   MACH.PROCD
Report: GEROY

OVERBECK
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

DIE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

NORTON EXTERNAL GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

GARDNER DISK GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine
```

File: MACH.PROCD
Report: GEROY

CINCINNATI THROUGH FEED GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

LANDIS PLUNGE DRIVE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

NORTON SURFACE GRINDER
Select/obtain WIP
Secure materials
Select/obtain prints
Check part to print
Select/obtain mount wheels
Select speed/feeds
Dress wheel
Center and true stock
Load/unload
Set/adjust stops
Adjust machine

SPIN FINISH
Locate fixture
Load/unload parts
Change/replace Head Bolts
Replace tension spring
Load media
Run
Set time levels
Inspect
Obtain WIP

```
File:   MACH.PROCD
Report: GEROY

VIBRO
Load/unload parts
Run
Set time levels
Inspect
Set weights
Adjust compounds
Set water pressure
Set compound flow
Obtain WIP


SWECO
Load/unload parts
Run
Set time levels
Inspect
Set weights
Adjust compounds
Set water pressures
Set compound flows
Obtain WIP


BARREL WASH TUMBLE
Load/unload parts
Run
Set time levels
Inspect
Adjust compounds
Set water pressures
Rust protect
Add water
Obtain WIP


BIG WASH
Load/unload parts
Load media
Run
Inspect
Obtain WIP
```

```
File:   MACH.PROCD
Report: GEROY

DERUST WASH
Load/unload parts
Load media Run
Inspect
Obtain WIP



SPRAY GUNS (PAINT BOOTH)
Load media
Inspect
Obtain WIP



POWDER COATING ROOM
Load/unload parts
Inspect
Set water pressures
Obtain WIP
Adjust heat



BUFFING LATHE
Load/unlaod parts
Run
Inspect
Obtain WIP
Select wheel
Adjust wheel
Select belt
```

File: MACH.PROCD
Report: GEROY

DIE GRINDER
Load/unload parts
Inspect
Obtain WIP
Select wheel
Adjust wheel
Select belt

DISC SANDER
Load/unload parts
Inspect
Obtain WIP
Select/attach sandpaper

BETA MACHINE
Load/unload parts
Inspect
Obtain WIP

FLOAT SANDER
Load/unload parts
Inspect
Obtain WIP
Select/attach sandpaper

```
File:   MACH.PROCD
Report: GEROY

DISC GRINDER  .
Load/unload parts
Obtain WIP
Select wheel
Adjust wheel
```

SECTION V

TECHNICAL KNOWLEDGE ASSOCIATED WITH EACH MACHINE

What technical knowledge is required
by each machine?

```
File:   MACH.TECH
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE
none



RADIAL DRILL PRESS
none



21" UPRIGHT SINGLE SPINDLE DRILL PRESS
none



NATCO MULTI-SPINDLE DRILL PRESS
none



TRANSFER LINE
none



JONES & LAMSON
none



MSO MACHINE
none



MSO 5 STATION RTM
none
```

File: MACH.TECH
Report: GEROY

9 STATION IN-LINE TRANSFER MACHINE
none

HEALD BOREMATIC MILLING MACHINE MODEL 222
none

HEALD BOREMATIC MILLING MACHINE MODEL 324-A
none

HORIZONTAL TURRET LATHE
none

SEIKI CNC NE LATHE
none

SEIKI CNC NEA LATHE
none

WARNER SWAZY AC LATHE
none

POTTER & JOHNSON CHUCKING LATHE
none

File: MACH.TECH
Report: GEROY

HEALD BOREMATIC MILLING MACHINE 321-A
none

ACROLOC 4 AXIS VMC W/CNC
Principles of CNC Programming

OKATA VM 4 AXIS W/ CNC
Principles of CNC Programming

CINCINNATI MONOSETT TOOL GRINDER
Knowledge of cutting tools

KO SURFACE GRINDER
Knowledge of cutting tools

DRILL GRINDER
Knowledge of cutting tools

TAP GRINDER
Knowledge of cutting tools

SURFACE GRINDER
Knowledge of cutting tools

File: MACH.TECH
Report: GEROY

SINGLE POINT CARBIDE GRINDER
Knowledge of cutting tools

BENCH GRINDER
Knowledge of cutting tools

CAM GRINDER
Knowledge of cutting tools

LANDIS EXTERNAL GRINDER
Knowledge of cutting tools

HEALD 271 GRINDER
Knowledge of cutting tools

HEALD PLAIN 222 GRINDER
Knowledge of cutting tools

HEALD SIZEMATIC 272 GRINDER
Knowledge of cutting tools

CINCINNATI 181 GRINDER
Knowledge of cutting tools

File: MACH.TECH
Report: GEROY

EXTERNAL STEP MASTER
Knowledge of cutting tools

OVERBECK
Knowledge of cutting tools

DIE GRINDER
Knowledge of cutting tools

NORTON EXTERNAL GRINDER
Knowledge of cutting tools

GARDNER DISK GRINDER
Knowledge of cutting tools

CINCINNATI THROUGH FEED GRINDER
Knowledge of cutting tools

LANDIS PLUNGE DRIVE GRINDER
Knowledge of cutting tools

NORTON SURFACE GRINDER
Knowledge of cutting tools

SECTION VI

GENERAL KNOWLEDGE ASSOCIATED WITH EACH MACHINE

What general knowledge is required by each machine?

File: MACH.GEN
Report: geroy

HEAVY DUTY VERTICAL DRILLING MACHINE
Read WIP, blueprints
Read & use scales
Read & use Vernier Calipers
Read & use micrometer
Read, use & fix gages
Read & use Thread, Plug, Pipe, & DL gages

TRANSFER LINE
Basic math
Metric-to-English conversion
Read/use micrometer & gages
Read blueprints
Read & understand WIP forms
Read & understand panel gages
Read & understand Hex Center gages
Read & understand plug gages
Read & understand Vernier calipers

JONES & LAMSON
Basic math
Metric-to-English conversion
Read/use micrometer & gages
Read blueprints
Read & understand WIP forms
Read & understand panel gages
Read & understand Hex Center gages
Read & understand plug gages
Read & understand Vernier calipers

MSO MACHINE
Basic math
Metric-to-English conversion
Read/use micrometer & gages
Read blueprints
Read & understand WIP forms
Read & understand panel gages
Read & understand Hex Center gages
Read & understand plug gages
Read & understand Vernier calipers

MSO 5 STATION RTM
Basic math
Metric-to-English conversion
Read/use micrometer & gages
Read blueprints
Read & understand WIP forms
Read & understand panel gages
Read & understand Hex Center gages
Read & understand plug gages
Read & understand Vernier calipers

File: MACH.GEN
Report: gerov

9 STATION IN-LINE TRANSFER MACHINE
Read blueprints
Read & understand WIP
Read/use micrometer & gages
Read blueprints
Read & understand WIP forms
Read & understand panel gages
Read & understand Hex Center gages
Read & understand plug gages
Read & understand Vernier calipers

HEALD BOREMATIC MILLING MACHINE MODEL 222
Basic math and trigonometry
Metric-to-English conversion
Ability to measure up to .0001" and 1/64th"
Use Clearance Plug, Concentricity & Tapered Plug Gages
Read & understand WIP forms and blueprints
Use Straight Plug
Read/use gages

HEALD BOREMATIC MILLING MACHINE MODEL 324-A
Basic math and trigonometry
Metric-to-English conversion
Ability to measure up to .0001" and 1/64th"
Use Clearance Plug, Concentricity & Tapered Plug gages
Read & understand WIP forms and blueprints
Use plug gages
Use straight plug
Read & use gages

HORIZONTAL TURRET LATHE
Basic math
Use plug gage
Read & understand WIP
Read blueprints
Complete quality audit
Use micrometer
Use Vernier calipers
Use Dial Bar Gage
Use Depth Gage

SEIKI CNC NE LATHE
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use depth scales
Read/use Vernier Calipers
Read/use gages

File: MACH.GEN
Report: geroy

SEIKI CNC NEA LATHE
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use depth scales
Read/use Vernier Calipers
Read/use gages

WARNER SWAZY AC LATHE
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use depth scales
Read/use Vernier Calipers
Read/use gages

POTTER & JOHNSON CHUCKING LATHE
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use depth scales
Read/use Vernier Calipers
Read/use gages

HEALD BOREMATIC MILLING MACHINE MODEL 321-A
Basic math and Trigonometry
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use depth and bar gages
Read/use Vernier Calipers
Read blueprints
Able to measure to .0001" and 1/64th"
Use clearance plug, concentricity, tapered plug gages
Use straight plug gage
Complete quality audit form
DELTA 6 SPINDLE DRILL PRESS
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use scales
Measure to .0001" and 1/64th"

File: MACH.GEN.
Report: gerov

DELTOFF 12, 18, 36 GUN DRILLS
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use scales
Measure to .0001" and 1/64th"

IR GUN DRILL
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use scales
Measure to .0001" and 1/64th"

SANVIK EJECTOR DRILL
Basic math
Metric-to-English conversion
Read/understand WIP
Read/use micrometer
Read/use scales
Measure to .0001" and 1/64th"

OKATA CNC MILLING MACHINE
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages

BRIDGEPORT CNC MILLING MACHINE
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages.

File: MACH.GEN
Report: geroy

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages

BRIDGEPORT VERTICAL MILL MACHINE

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages

CINCINNATI RISE & FALL MILLING MACHINE

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages

DUPLEX-TWIN HEAD MILLING MACHINE

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers
Triangulation (trigonometry)
Read/use radius gages

K & T SERIES E B VERTICAL MILLING MACHINE W/ NC TAPE

Read/use blueprints, WIP
Read/use location gages, indicators
Read/use scales, micrometers

File: MACH.GEN
Report: geroy

K & T 180 4 AXIS W/ NC TAPE
Read/use blueprints, WIP
Read/use location gages, indicators
Read/use scales, micrometers

CINCINNATI 720 3 AXIS VMC W/ NC TAPE
Read/use blueprints, WIP
Read/use location gages,
Read/use scales, indicators, micrometers

K & T 1436 A DUPLEX MILLING MACHINE
Read/use blueprints, WIP
Read/use location gages,
Read/use scales, depth gages, indicators, micrometers

CINCINNATI 5 HORIZONTAL MILLING MACHINE
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers

CINCINNATI 2 HORIZONTAL MILLING MACHINE
Read/use blueprints, WIP
Read/use location gages
Read/use scales, depth gages, indicators, micrometers

File: MACH.GEN
Report: gerov

SCHAFFNER RISE & FALL MILLING MACHINE
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use scales
Measure to .0001" and 1/64th"

CINCINNATI 107/122 RISE & FALL MILLING MACHINE
Basic math
Metric-to-English conversion
Read/use scales
Measure to .0001" and 1/64th"

BRIDGEPORT 4 AXIS VMC W/ CNC
Basic math
Metric-to-English conversion
Read/use gages
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers

ACROLOC 4 AXIS VMC W/ CNC
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers

OKATA VM 4 AXIS W/CNC
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use location gages, Vernier calipers,
Read/use scales, depth gages, indicators, micrometers
Measure to .0001" and 1/64th"
Read/use inside micrometers

File: MACH.GEN
Report: geroy

CINCINNATI MONOSETT TOOL GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

KO SURFACE GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

DRILL GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

SURFACE GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

TAP GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

File: MACH.GEN
Report: geroy

SINGLE POINT CARBIDE GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

BENCH GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

CAM GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

LANDIS EXTERNAL GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

HEALD 271 GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

File: MACH.GEN
Report: gerov

HEALD PLAIN 222 GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

HEALD SIZEMATIC 272 GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

CINCINNATI 181 GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

EXTERNAL STEP MASTER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

OVERBECK
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

File: MACH.GEN
Report: geroy

DIE GRINDER

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

NORTON EXTERNAL GRINDER

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

GARDNER DISK GRINDER

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

CINCINNATI THROUGH FEED GRINDER

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

LANDIS PLUNGE DRIVE GRINDER

Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

File: MACH.GEN
Report: geroy

NORTON SURFACE GRINDER
Basic math
Metric-to-English conversion
Read/use blueprints, WIP
Read/use Vernier calipers
Read/use scales, depth gages, indicators
Measure to .0001" and 1/64th"
Read/use micrometers
Use trigonometry
Read machinist's handbook

SPIN FINISH
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

VIBRO
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

SWECO
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

BARREL MACHINE TUMBLE
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

File: MACH.GEN
Report: geroy

BIG WASH
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

DERUST WASH
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

SPRAY GUNS
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

POWDER COATING ROOM
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

BUFFING LATHE
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

File: MACH.GEN
Report: geroy

DIE GRINDER
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

DISC SANDER
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

BETA MACHINE
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

FLOAT SANDER
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

DISC GRINDER
Basic math
Properties of polishing steel
Read/use blueprints
Read/comprehend WIP
Read/use gages
Use hand tools
Use air tools

SECTION VII

SYSTEMS KNOWLEDGE ASSOCIATED WITH EACH MACHINE

What systems knowledge is required
by each machine?

File: MACH.SYS
Report: GEROY

HEAVY DUTY VERTICAL DRILLING MACHINE
Identify malfunction in machine
Obtain service
Obtain WIP, tooling & prints
Adjust speed

TRANSFER LINE
Locate prints, tooling, and WIP
Identify malfunction on machine
Obtain service for machine

JONES & LAMSON
Locate prints, tooling, and WIP
Identify malfunction on machine
Obtain service for machine

MSO MACHINE
Locate prints, tooling, and WIP
Identify malfunction on machine
Obtain service for machine

MSO 5 STATION RTM
Locate prints, tooling, and WIP
Identify malfunction on machine
Obtain service for machine

File: MACH.SYS
Report: GEROY

9 STATION IN-LINE TRANSFER MACHINE
Locate prints, tooling, and WIP
Identify malfunction on machine
Obtain service for machine

HEALD BOREMATIC MILLING MACHINE MODEL 222
Check hydraulic oil level
Identify malfunction on machine
Obtain service for machine
Monitor air pressure
Monitor hydraulic oil

HEALD BOREMATIC MILLING MACHINE MODEL 324-A
Check hydraulic oil level
Identify malfunction on machine
Obtain service for machine
Monitor air pressure
Monitor hydraulic oil

HORIZONTAL TURRET LATHE
Check hydraulic oil level
Identify malfunction on machine
Obtain service for machine
Monitor air pressure

SEIKI CNC NE LATHE
Locate prints and tape
Identify malfunction on machine
Obtain service for machine

File: MACH.SYS
Report: GEROY

SEIKI CNC NEA LATHE
Locate prints and tape
Identify malfunction on machine
Obtain service for machine

WARNER SWAZY AC LATHE
Locate prints and tape
Identify malfunction on machine
Obtain service for machine

POTTER & JOHNSON CHUCKING LATHE
Locate prints and tape
Identify malfunction on machine
Obtain service for machine

HEALD BOREMATIC MILLING MACHINE MODEL 321-A
Check hydraulic oil level
Identify malfunction on machine
Obtain service for machine
Monitor air pressure
Monitor hydraulic oil

DELTA 6 SPINDLE DRILL PRESS
Monitor oil pressure

File: MACH.SYS
Report: GEROY

DELTOFF 12, 18, 36 GUN DRILLS
Monitor oil pressure

I. R. GUN DRILL
Monitor oil pressure

SANVIK EJECTOR DRILL PART
Monitor oil pressure

OKATA CNC MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil

BRIDGEPORT CNC MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels

```
File:   MACH.SYS
Report: GEROY

CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels



BRIDGEPORT VERTICAL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels



CINCINNATI RISE & FALL
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels



DUPLEX TWIN HEAD MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels



K & T SERIES E B VERTICAL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
```

File: MACH.SYS
Report: GEROY

K & T 1804 AXIS W/ NC TAPE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

CINCINNATI 720 3 AXIS VMC W/ NC TAPE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

K & T 1436 A DUPLEX MILL
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

CINCINNATI 5 HORIZONTAL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

CINCINNATI 2 HORIZONTAL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

File: MACH.SYS
Report: GEROY

SCHAFFNER RISE & FALL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

CINCINNATI 107/122 RISE & FALL MILLING MACHINE
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP

BRIDGEPORT 4 AXIS VMC W/ CNC
Identify malfunction in machine
Obtain service for machine
Locate tape, print, WIP
Check hydraulic oil levels

ACROLOC 4 AXIS VMC W/CNC
Check hydraulic oil
Identify malfunction in machine
Locate tape, print, WIP
Obtain service for malfunction

OKATA VM 4 AXIS W/CNC
Check hydraulic oil
Identify malfuntion in machine
Locate tape, print, WIP

```
File:   MACH.SYS
Report: GEROY

CINCINNATI MONOSETT TOOL GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




KO SURFACE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




DRILL GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




SURFACE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




TAP GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance
```

File: MACH.SYS
Report: GEROY

SINGLE POINT CARBIDE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

BENCH GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

CAM GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

LANDIS EXTERNAL GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

HEALD 271 GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

File: MACH.SYS
Report: GEROY

HEALD PLAIN 222 GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

HEALD SIZEMATIC 272 GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

CINCINNATI 181 GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

EXTERNAL STEP MASTER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

OVERBECK
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

```
File:   MACH.SYS
Report: GEROY

DIE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




NORTON EXTERNAL GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




GARDNER DISK GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




CINCINNATI THROUGH FEED GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance




LANDIS PLUNGE DRIVE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance
```

File: MACH.SYS
Report: GEROY

NORTON SURFACE GRINDER
Locate prints
Identify malfunction
Obtain service
Routine machine maintenance

SPIN FINISH
Routine machine maintenance
Obtain service
Identify malfunction
Simple Drive system

VIBRO
Routine machine maintenance
Obtain service
Identify malfunction
Simple Drive System

SWECO
Routine machine maintenance
Obtain service
Identify malfunction
Simple Drive System

BARREL MACHINE TUMBLER
Routine machine maintenance
Obtain service

File: MACH.SYS
Report: GEROY

BIG WASH
Routine machine maintenance
Obtain service

DERUST WASH
Routine machine maintenance
Obtain service

SPRAY GUNS (PAINT BOOTH)
Routine machine maintenance
Obtain service

POWDER COATING ROOM
Routine machine maintenance
Obtain service

BUFFING LATHE
Routine machine maintenance
Obtain service

File: MACH.SYS
Report: GEROY

DIE GRINDER
Routine machine maintenance
Obtain service

DISC SANDER
Routine machine maintenance
Obtain service

BETA MACHINE
Routine machine maintenance
Obtain service

FLOAT SANDER
Routine machine maintenance
Obtain service

DISC GRINDER
Routine machine maintenance
Obtain service

Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

August 1987

Volume 3

Section VIII - XI

Tasks

The Pennsylvania State University

Division of Counseling and Educational Psychology
and Career Studies

SECTION VIII

GENERAL KNOWLEDGE ASSOCIATED WITH EACH TASK

What general knowledge is required for each task?

File: TASK GEN
Report: GEROY

TASK: OPERATE STANDARD END PLATE FINISHING LATHE
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth and flatness gages
Read concentricity gages
Read plug gages
Use length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: OPERATE DRILL PRESS
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth and flatness gages
Read concentricity gages
Read plug gages
Use length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: OPERATE BRIDGEPORT MILLING MACHINE
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth and flatness gages
Read concentricty gages
Read plug gages
Use length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

File: TASK GEN
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: SET UP STANDARD END PLATE FINISHING LATHE
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: SET UP DRILL PRESS
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: SET UP BRIDGEPORT MILLING MACHINE
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

File: TASK GEN
Report: GEROY

TASK: OPERATE BRIDGEPORT MILLING MACHINE
Read blueprints
Read/comprehend routing forms
Read setup sheets
Read manuals
Read micrometers
Read heighth gages
Read flatness gages
Read concentricity gages
Read plug and length gages
Metric-to-English conversion
Measure up to .001"
Measure up to 1/64"

TASK: SET UP SUNNEN HORIZONTAL HONE
Basic math skills
Read WIP forms
Read job cards
Read prints
Use plug gages

TASK:OPERATE SUNNEN HORIZONTAL HONE
Basic math skills
Read WIP forms
Read job cards
Read prints
Use plug gages

TASK: MAINTAIN CRIB SERVICE
Be able to complete various forms
Perform basic math operations

File: TASK GEN
Report: GEROY

TASK: MAINTAIN INVENTORY OF TOOLS
Be able to complete various forms

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE KO SURFACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE HEALD TOOL GRINDING MACHINE
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

File: TASK GEN
Report: GEROY

TASK: OPERATE NORTON SURFACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE DRILL GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE SURACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE HOBB MACHINE
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

File: TASK GEN
Report: GEROY

TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE TAP GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE THREAD CHASER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE GLEASON CUTTER-SHAPER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

File: TASK GEN
Report: GEROY

TASK: OPERATE SINGLE POINT CARBIDE GRINDER

Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE SUNNEN PRECISION HONING MACHINE

Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE DRILL PRESS

Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson blocks
Use comparator
Use measuring wires
Use Machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE MILLING MACHINES

Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

File: TASK GEN
Report: GEROY

TASK: OPERATE LATHE(S)
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE JIG BORE
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE SURFACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE BENCH GRINDERS
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

File: TASK GEN
Report: GEROY

TASK: OPERATE CONTOUR SAW
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE CAM GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: SET UP LANDIS EXTERNAL GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE LANDIS EXTERNAL GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

File: TASK GEN
Report: GEROY

TASK: SET UP NORTON EXTERNAL GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE NORTON EXTERNAL GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

File: TASK GEN
Report: GEROY

TASK: SET UP CINCINNATI THRU FEED GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE CINCINNATI THRU FEED GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

File: TASK GEN
Report: GEROY

TASK: SET UP HEALD MODEL 271 GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE HEALD MODEL 271 GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: SET UP HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

File: TASK GEN
Report: GEROY

TASK: SET UP CINCINNATI MODEL 181 GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE CINCINNATI MODEL 181 GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: SET UP EXTERNAL STEPMASTER GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: OPERATE EXTERNAL STEPMASTER GRINDER
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

File: TASK GEN
Report: GEROY

TASK: SET UP ROTARY VERTICAL SPINDLE
Basic skills math
Read prints and drawings
Use scales
Use micrometers
Use depth gages
Use shadow gages
Use radius gages
Use flatness gages
Measure to .0001"

TASK: ASSEMBLE COMPONENTS FOR TOOLS
Read manuals
Understand torque pressures
Read prints
Read assembly orders
Read Vernier micrometers
Read micrometers

TASK: OPERATE ROBOT TEST CELL
Basic mathematics
Basic programming
Read complex service manuals
Enter information into a log
Read Vernier calipers
Read micrometers

TASK: STAMP IDENTIFICATION NUMBER ON PARTS
Read WIP Forms
Read Blueprints
Use Location Gages

File: TASK GEN
Report: GEROY

TASK: OPERATE ROLL STAMP
Read WIP Forms
Read Blueprints
Use Location Gages

TASK: OPERATE POWER PRESS
Read WIP Forms
Read Blueprints
Use Location Gages

TASK: ASSEMBLE TWO OR MORE PARTS
Read WIP Forms
Read Blueprints
Use Location Gages

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE
Basic Math skills
Trigonometry
Ability to measure up to .0001"
Ability to measure up to 1/64"
Metric to English conversion
Use clearance plug gages
Use concentricity gages
Use tapered plug gages
Read and comprehend WIP forms
Read blueprints
Use straight plug

File: TASK GEN
Report: GEROY

TASK: OPERATE STANDARD HEALD BOREMATIC MACHINE
Basic Math skills
Trigonometry
Ability to measure up to .0001"
Ability to measure up to 1/64"
Metric to English conversion
Use clearance plug gages
Use concentricity gages
Use tapered plug gages
Read and comprehend WIP forms
Read blueprints
Use straight plug

TASK: SET UP HEALD BOREMATIC PIN MACHINE
Basic Math skills
Trigonometry
Ability to measure up to .0001"
Ability to measure up to 1/64"
Metric to English conversion
Use clearance plug gages
Use concentricity gages
Use tapered plug gages
Read and comprehend WIP forms
Read blueprints
Use straight plug

TASK: OPERATE HEALD BOREMATIC PIN MACHINE
Basic Math skills
Trigonometry
Ability to measure up to .0001"
Ability to measure up to 1/64"
Metric to English conversion
Use clearance plug gages
Use concentricity gages
Use tapered plug gages
Read and comprehend WIP forms
Read blueprints
Use straight plug

TASK: SET UP TRANSFER MACHINE
Basic MAth
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

File: TASK GEN
Report: GEROY

TASK: OPERATE TRANSFER MACHINE
Basic MAth
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

TASK: SET UP JONES AND LAMSON ATL
Basic Math
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

TASK: OPERATE JONES AND LAMSON ATL
Basic MAth
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

TASK: SET UP MSO MACHINE
Basic MAth
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

File: TASK GEN
Report: GEROY

TASK: OPERATE MSO MACHINE
Basic MAth
Metric-to-English conversion
Use micrometers
Use and locate gages
Read blueprints
Read WIP forms
Use panel gages
Use Hex center gage
Use plug gage
Use Vernier calipers

TASK: OPERATE FURNACE
Basic math
Read blueprints
Read circular chart
Use Rockwell Hardness tester
Read WIP forms
Read Work Cards

TASK:OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE
Basic math
Read timers
Set controls

TASK: OPERATE BLACK OXIDE LINE
Basic math
Read timers
Set controls

File: TASK GEN
Report: GEROY

TASK: OPERATE STRAIGHTENING PRESS
Basic math
Read timers
Set controls

TASK: OPERATE LAPPING MACHINE
Basic math
Read timers
Set controls

TASK: OPERATE FORGE FURNACE
Basic math
Read blueprints
Use scales
Use slip gages
Read WIP forms
Read Work Cards

TASK: OPERATE UPSET HAMMER
Basic math
Read blueprints
Use scales
Use slip gages
Read WIP forms
Read Work Cards

File: TASK GEN
Report: GEROY

TASK: OPERATE RICHARD'S BENDER
Basic math
Read blueprints
Use scales
Use slip gages
Read WIP forms
Read Work Cards

TASK: SET UP POTTER & JOHNSON AC
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: OPERATE POTTER & JOHNSON AC
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

File: TASK GEN
Report: GEROY

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: OPERATE WARNER SWAZY AC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

File: TASK GEN
Report: GEROY

TASK: SET UP WARNER SWAZY AC LATHE
Basic math
Metric-to-English conversion
Read WIP Routing forms
Use micrometers
Use depth scales
Use Vernier calipers
Use gages

TASK: SET UP 4-6 SPINDLE GANG DRILL
Blueprint reading
Use scales
Use micrometer
Fixed gages:Thread plugs
Measurements to .001"
Read WIP cards

TASK: OPERATE 4-6 SPINDLE GANG DRILL
Blueprint reading
Use scales
Use micrometer
Fixed gages:Thread plugs
Measurements to .001"
Read WIP cards

TASK: SHARPEN DRILLS
Blueprint reading
Use scales
Use micrometer
Fixed gages:Thread plugs
Measurements to .001"
Read WIP cards
Use scales
Pipe gages

File: TASK GEN
Report: GEROY

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: SET UP RADIAL DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: OPERATE RADIAL DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

File: TASK GEN
Report: GEROY

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: SETUP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Blueprint reading
Read WIP cards
Use micrometer
Fixed gages:Thread plugs
Measurements to .001" and 1/64"
Use Vernier calipers
Use scales
Pipe gages

File: TASK GEN
Report: GEROY

TASK: OPERATE AN OKATA CNC MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: OPERATE A BRIDGEPORT CNC MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: SET UP AN OKATA CNC MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms
Understanding of trigonometry

TASK: SET UP A BRIDGEPORT CNC MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms
Understanding of trigonometry

File: TASK GEN
Report: GEROY

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

File: TASK GEN
Report: GEROY

TASK: SET UP CINCINNATI RISE AND FALL
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: OPERATE CINCINNATI RISE AND FALL
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: SET UP DUPLEX-TWIN MILL
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

TASK: OPERATE DUPLEX-TWIN MILL
Basic math skills
Ability to measure up to .0001" and 1/64"
Metric-to-English conversions
Use scales
Use depth and radius gages
Use indicators
Use location gages
Use micrometers and Vernier calipers
Read blueprints
Read and comprehend WIP routing forms

File: TASK GEN
Report: GEROY

TASK: SET UP MILWAUKEE MATIC EB
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE MILWAUKEE MATIC EB
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: SET UP CNC MACHINE LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE CNC MACHINE LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

File: TASK GEN
Report: GEROY

TASK: SET UP CNC COMBI-LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE CNC COMBI-LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: SET UP K & T 180
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE K & T 180
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

File: TASK GEN
Report: GEROY

TASK: SET UP SCIMMX
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE SCIMMX
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: SET UP DO ALL SAW
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE DO ALL SAW
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

File: TASK GEN
Report: GEROY

TASK: SET UP A LINES LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE A LINES LATHE
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: SET UP SEIKI LATHE(S)
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

TASK: OPERATE SEIKI LATHE(S)
Basic math
Measurement up to .0001"
Read blueprints
Read WIP Routing Form
Read Machine Manuals

File: TASK GEN
Report: GEROY

TASK: SET UP WAGNER SAW
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE WAGNER SAW
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: SET UP BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

File: TASK GEN
Report: GEROY

TASK: SET UP ANVILL MILL
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE ANVILL MILL
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: SET UP VERTICAL BROACHES
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE VERTICAL BROACHES
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

File: TASK GEN
Report: GEROY

TASK:SET UP MSO MACHINE
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE MSO MACHINE
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: SET UP BURKE TWIN MILL
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE BURKE TWIN MILL
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

File: TASK GEN
Report: GEROY

TASK: OPERATE VIBRO
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: OPERATE OVERBECK GRINDER
Basic math skills
Use Co-Planer gages
Use Center Line gages
Use Micrometers
Use Vernier Calipers
Read WIP forms
Read blueprints

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"

File: TASK GEN
Report: GEROY

TASK: SET UP AUTOMATIC SCREW MACHINES
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"

TASK: OPERATE AUTOMATIC SCREW MACHINES
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"

TASK: SET UP GEAR SHAPER
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"
Read machinist's handbook for formulas
Use ruler

TASK: OPERATE GEAR SHAPER
Basic math skills
Use micrometers
Read WIP forms
Read blueprints
Measure up to .001"
Read Machinist's handbook for formulas
Use ruler

File: TASK GEN
Report: GEROY

TASK: OPERATE SWECO
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE A BARREL MACHINE TUMBLER
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE A BIG WASH
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE A DERUST WASH
Basic addition
Percentages
Decimals
Read WIP routing forms

File: TASK GEN
Report: GEROY

TASK: OPERATE SPRAY GUNS
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE POWDER COATING ROOM
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE SPIN FINISH MACHINE
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE POLISHER LATHE
Basic addition
Percentages
Decimals
Read WIP routing forms

File: TASK GEN
Report: GEROY

TASK: OPERATE DIE GRINDER
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE DISC SANDER
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE BETA MACHINE
Basic addition
Percentages
Decimals
Read WIP routing forms

TASK: OPERATE FLOAT SANDER
Basic addition
Percentages
Decimals
Read WIP routing forms

SECTION IX

SYSTEMS KNOWLEDGE ASSOCIATED WITH EACH TASK

What systems knowledge is required for each task?

File: TASK SYS
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: OPERATE STANDARD END PLATE FINISHING LATHE
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: OPERATE DRILL PRESS
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: OPERATE BRIDGEPORT MILLING MACHINE
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: SET UP SEIKI AUTOMATIC TURRET MACHINE(S)
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

File: TASK SYS
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: SET UP STANDARD END PLATE FINISHING LATHE
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: SET UP DRILL PRESS
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: OPERATE DRILL PRESS
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: SET UP BRIDGEPORT MILLING MACHINE
Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

File: TASK SY
Report: GEROY

TASK: OPERATE BRIDGEPORT MILLING MACHINE

Identify malfunction system on the machine
Obtain service for the machine
Maintain proper oil levels
Locate prints
Locate WIP forms

TASK: SET UP SUNNEN HORIZONTAL HONE

Identify problems with machine
Know where to obtain plug gaging
Obtain service for machine
Know how to replace stone on machine

TASK: OPERATE SUNNEN HORIZONTAL HONE

Identify problems with machine
Know where to obtain plug gaging
Obtain service for machine
Know how to replace stone on machine

TASK: MAINTAIN CRIB SERVICE

Locate tools in the plant
Locate gages and scrap material in the plant
Requisition tools

TASK: MAINTAIN INVENTORY OF TOOLS

Know which forms are used for ordering tools

File: TASK SYS
Report: GEROY

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE KO SURFACE GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE HEALD TOOL GRINDING MACHINE
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE NORTON SURFACE GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE DRILL GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

File: TASK SYS
Report: GEROY

TASK: OPERATE SURFACE GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE HOBB MACHINE
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE TAP GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE THREAD CHASER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

File: TASK SYS
Report: GEROY

TASK: OPERATE GLEASON CUTTER-SHAPER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE SINGLE POINT CARBIDE GRINDER
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK: OPERATE SUNNEN PRECISION HONING MACHINE
Identify malfunctioning systems on the machine
Obtain service for machine
Locate prints
Know the intended purpose of the workpiece

TASK:OPERATE DRILL PRESS
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE MILLING MACHINE
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

File: TASK SYS
Report: GEROY

TASK: OPERATE LATHE
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE VERTICAL SHAPER
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE JIG BORE
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE JIG GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE SURFACE GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

File: TASK SYS
Report: GEROY

TASK: OPERATE CAM GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE BENCH GRINDERS
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: OPERATE CONTOUR SAW
Identify malfunctioning systems of the machine
Obtain service for machine
Locate parts
Know the intended purpose of the workpiece

TASK: SET UP LANDIS EXTERNAL GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE LANDIS EXTERNAL GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

File: TASK SYS
Report: GEROY

TASK: SET UP NORTON EXTERNAL GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE NORTON EXTERNAL GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP CINCINNAT THRU FEEDER GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

File: TASK SYS
Report: GEROY

TASK: OPERATE CINCINNATI THRU FEED GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP HEALD MODEL 271 GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE HEALD MODEL 271 GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

File: TASK SYS
Report: GEROY

TASK: SET UP HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE HEALD MODEL 272 PLAIN OR SIZEMATIC GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP CINCINNATI MODEL 181 GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE CINCINNATI MODEL 181 GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP EXTERNAL STEPMASTER GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

File: TASK SYS
Report: GEROY

TASK: OPERATE EXTERNAL STEPMASTER GRINDER
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: SET UP ROTARY VERTICAL SPINDLE
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: OPERATE ROTARY VERTICAL SPINDLE
Identify malfunctioning systems of the machine
Obtain service for machine
Know when to replace grinding wheel
Know how to replace grinding wheel

TASK: ASSEMBLE COMPONENTS FOR TOOLS
Know where to obtain assembly orders
Know where to send improper parts

TASK: OPERATE ROBOT TEST CELL
Monitor equipment for proper settings
Monitor equipment for proper operation
Adjust equipment if necessary

File: TASK SYS
Report: GEROY

TASK: STAMP IDENTIFICATION NUMBER ON PARTS
None

TASK: OPERATE ROLL STAMP
Identify problems with euqipment
Obtain service for equipment

TASK: OPERATE POWER PRESS
Identify problems with equipment
Obtain service for equipment

TASK: ASSEMBLE TWO OR MORE PARTS
none

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE
Check hydraulic oil level
Identify malfunctioning system on machine
Obtain service for machine
Monitor air pressure on machine
Monitor hydraulic oil pressures

File: TASK SYS
Report: GEROY

TASK: OPERATE STANDARD HEALD BOREMATIC MACHINE
Check hydraulic oil level
Identify malfunctioning system on machine
Obtain service for machine
Monitor air pressure on machine
Monitor hydraulic oil pressures

TASK: SET UP HEALD BOREMATIC PIN MACHINE
Check hydraulic oil level
Identify malfunctioning system on machine
Obtain service for machine
Monitor air pressure on machine
Monitor hydraulic oil pressures

TASK: OPERATE HEALD BOREMATIC PIN MACHINE
Check hydraulic oil level
Identify malfunctioning system on machine
Obtain service for machine
Monitor air pressure on machine
Monitor hydraulic oil pressures

TASK: SET UP TRANSFER MACHINE
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

TASK: OPERATE TRANSFER MACHINE
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

File: TASK SYS
Report: GEROY

TASK: SET UP JONES AND LAMSON ATL
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

TASK: OPERATE JONES AND LAMSON ATL
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

TASK: SET UP MSO MACHINE
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

TASK: OPERATE MSO MACHINE
Know where to obtain WIP, tooling and prints
ID problems with machine
Obtain service for machine

TASK: OPERATE FURNACE
Know how to set computer controls
Know how to set manual instruments
Identify problems with equipment
Obtain service for equipment

File: TASK SYS
Report: GEROY

TASK: OPERATE FORGE FURNACE
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: OPERATE UPSET HAMMER
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: OPERATE RICHARD'S BENDER
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: OPERATE BLACK OXIDE LINE
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

File: TASK SYS
Report: GEROY

TASK: OPERATE STRAIGHTENING PRESS
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: OPERATE LAPPING MACHINE
Identify problems with equipment
Requisition service for equipment
Know where to obtain WIP
Know where to obtain job cards
Know how to adjust equipment for proper temperatures

TASK: SET UP POTTER & JOHNSON AC
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: OPERATE POTTER & JOHNSON AC
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

File: TASK SYS
Report: GEROY

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: SET UP WARNER SWAZY AC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

TASK: OPERATE WARNER SWAZY AC LATHE
Locate prints
Locate tape
Identify problems with the machine
Obtain service for the machine

File: TASK SYS
Report: GEROY

TASK: SET UP 4-6 SPINDLE GANG DRILL
Identify problems with machines
Obtain service for machine
How to obtain WIP forms, tooling, prints
How to adjust machine for correct speed

TASK: OPERATE 4-6 SPINDLE GANG DRILL
Identify problems with machines
Obtain service for machines
How to obtain blueprints, WIP, tooling
How to adjust machines for correct speed

TASK: SHARPEN DRILL
Identify problems with machines
Obtain service for machines
How to obtain WIP forms, Tooling, and blueprints
How to adjust machines for correct speed

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

File: TASK SYS
Report: GEROY

TASK: SET UP RADIAL DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: OPERATE RADIAL DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: SET-UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

File: TASK SYS
Report: GEROY

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
How to adjust machines for correct speeds

TASK: OPERATE A CNC OKATA MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: OPERATE A CNC BRIDGEPORT MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: SET UP A CNC OKATA MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: SET UP A CNC BRIDGEPORT MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

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File:   TASK SYS
Report: GEROY

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil




TASK: OPERATE HORIZONTAL/VERTICAL MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil




TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil




TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil




TASK:SET UP CINCINNATI RISE AND FALL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
```

File: TASK SYS
Report: GEROY

TASK: OPERATE CINCINNATI RISE AND FALL-ROLLERS
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: SET UP DUPLEX-TWIN MILL MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: OPERATE DUPLEX-TWIN MILL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil

TASK: SET UP MILWAUKEE EB
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lube and oil machine

TASK: OPERATE MILWAUKEE MATIC EB
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

```
File:   TASK SYS
Report: GEROY

TASK: SET UP CNC MACHINE LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine


TASK: OPERATE CNC MACHINE LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine


TASK: SET UP CNC COMBI-LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine


TASK: OPERATE CNC COMBI-LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine


TASK: SET UP K & T 180
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine
```

File: TASK SYS
Report: GEROY

TASK: OPERATE K & T 180
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: SET UP SCIMMX
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: OPERATE SCIMMX
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: SET UP DO ALL SAW
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: OPERATE DO ALL SAW
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

File: TASK SYS
Report: GEROY

TASK: SET UP A LINES LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: OPERATE A LINES LATHE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints
Check hydraulic oil
Locate gaging
Monitor oil levels
Lub and oil machine

TASK: SET UP WAGNER SAW
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE WAGNER SAW
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

File: TASK SYS
Report: GEROY

TASK: OPERATE BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP ANVILL MILL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE ANVILL MILL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP VERTICAL BROACH
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE VERTICAL BROACH
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

File: TASK SYS
Report: GEROY

TASK: SET UP MSO MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE MSO MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP BURKE TWIN MILL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE BURKE TWIN MILL
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE VIBRO
Identify problems with machines
Obtain service for machines

File: TASK SYS
Report: GEROY

TASK: OPERATE OVERBECK GRINDER
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP GEAR SHAPER
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE GEAR SHAPER
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

File: TASK SYS
Report: GEROY

TASK: SET UP AUTOMATIC SCREW MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE AUTOMATIC SCREW MACHINE
Identify problems with machines
Obtain service for machines
How to obtain WIP, tooling, and blueprints

TASK: OPERATE A SWECO
Know how to adjust weights, timing, roll, feed,
Know how to adjust amplitude, compounds and water pressure
Identify problems with machine

TASK: OPERATE A BARREL MACHINE TUMBLER
Know how to adjust weights, timing, roll, feed,
Know how to adjust amplitude, compounds and water pressure
Identify problems with machine

TASK: OPERATE A BIG WASH
Know how to adjust weights, timing, roll, feed,
Know how to adjust amplitude, compounds and water pressure
Identify problems with machine

File: TASK SYS
Report: GEROY

TASK: OPERATE A DERUST WASH
Know how to adjust weights, timing, roll, feed,
Know how to adjust amplitude, compounds and water pressure
Identify problems with machine

TASK: OPERATE A SPIN FINISH MACHINE
Identify malfunctioning motor bearings, belts, and air pump in machine

TASK: OPERATE PAINT BOOTH
Know where to obtain powder coatings
Know how to clean powder coating container
Know how to clean spray gun

TASK: OPERATE POWDER COATING ROOM
Identify problems with the powder coating equipment
Requisition service for the Powder Coating Room

TASK: OPERATE BUFFING LATHE
Know when to replace wheels
Adjust belts
Identify malfunctioning system on machine
Requisition service for machine
Identify type of wheel to use

File: TASK SYS
Report: GEROY

TASK: OPERATE DIE GRINDER
Know when to replace wheels
Adjust belts
Identify malfunctioning system on machine
Requisition service for machine
Identify type of wheels to use

TASK: OPERATE DISC SANDER
Must know when to replace sandpaper
Identify problems with machine
Requisition service for machine

TASK: OPERATE BETA MACHINE
Obtain WIP form
Select grinding wheel
Attach grinding wheel
Adjust machine
Run

TASK: OPERATE FLOAT SANDER
Must know when to replace sandpaper
Identify problems with the machine
Requisition service for the machine

SECTION X

TECHNICAL KNOWLEDGE ASSOCIATED WITH EACH TASK

What technical knowledge is required by each task?

File: TASK TECH
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE
None

TASK: OPERATE STANDARD ENDPLATE FINISHING LATHE
None

TASK: OPERATE DRILL PRESS
None

TASK: OPERATE BRIDGEPORT MILLING MACHINE
None

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE
None

File: TASK TECH
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE
None

TASK: SET UP DRILL PRESS
None

TASK: OPERATE DRILL PRESS
None

TASK: SET UP BRIDGEPORT MILLING MACHINE
None

TASK: OPERATE BRIDGEPORT MILLING MACHINE
None

File: TASK TECH
Report: GEROY

TASK: SET UP SUNNEN HORIZONTAL HONE
None

TASK: OPERATE SUNNEN HORIZONTAL HONE
none

TASK: MAINTAIN CRIB SERVICE
Must know which tools are used in various areas of the plant

TASK: MAINTAIN INVENTORY OF TOOLS
none

TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

File: TASK TECH
Report: GEROY

TASK: OPERATE KO SURFACE GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE HEALD TOOL GRINDING MACHINE
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE NORTON SURFACE GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE DRILL MACHINE
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE SURFACE GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

File: TASK TECH
Report: GEROY

TASK: OPERATE HOBB MACHINE
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE TAP GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE THREAD CHASER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE GLEASON CUTTER-SHAPER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

File: TASK TECH
Report: GEROY

TASK: OPERATE SINGLE POINT CARBIDE GRINDER
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE SUNNEN PRECISION HONING MACHINE
Understand the expansion/contracting properties of metals
Understand the cutting qualities of various metals
Understand the grinding qualities of steel and carbide
Understand the polishing qualities of steel and carbide

TASK: OPERATE
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE DRILL PRESS
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE MILLING MACHINES
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

File: TASK TECH
Report: GEROY

TASK: OPERATE LATHE

Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE JIG BORE

Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE SURFACE GRINDER

Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE BENCH GRINDERS

Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE CONTOUR SAW

Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

File: TASK TECH
Report: GEROY

TASK: OPERATE VERTICAL SHAPER
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE CAM GRINDER
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: SET UP LANDIS EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP NORTON EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY

TASK: OPERATE NORTON EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI THRU FEED GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI THRU FEED GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 271 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 271 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 272 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY

TASK: OPERATE HEALD MODEL 272 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI MODEL 181 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI MODEL 181 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP EXTERNAL STEPMASTER GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE EXTERNAL STEPMASTER GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY

TASK: SET UP ROTARY VERTICAL SPINDLE
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE ROTARY VERTICAL SPINDLE
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: ASSEMBLE COMPONENTS FOR TOOLS
None

TASK: OPERATE ROBOT TEST CELL
Know how to service and maintain mechanical robot

TASK: STAMP IDENTIFICATION NUMBER ON PARTS
none

TASK: OPERATE ROLL STAMP
none

TASK: OPERATE POWER PRESS
none

TASK: ASSEMBLE TWO OR MORE PARTS
none

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE
none

TASK: OPERATE A HEALD BORE MATIC MILLING MACHINE MODEL 222
none

File: TASK TECH
Report: GEROY

TASK: SET UP HEALD BOREMATIC PIN MACHINE
none

TASK: OPERATE HEALD BOREMATIC PIN MACHINE
none

TASK: SET UP HORIZONTAL TURRET LATHE
none

TASK: OPERATE HORIZONTAL TURRET LATHE
none

TASK: SET UP TRANSFER MACHINE
none

File: TASK TECH
Report: GEROY

TASK: OPERATE TRANSFER MACHINE
none

TASK: SET UP JONES AND LAMSON ATL
none

TASK: OPERATE JONES AND LAMSON ATL
none

TASK: SET UP MSO
none

TASK: OPERATE MSO
none

File: TASK TECH
Report: GEROY

TASK: OPERATE FURNACE
none

TASK: OPERATE FORGE FURNACE
Must understand the tempering properties of steel

TASK: OPERATE UPSET HAMMER
Must understand the tempering properties of steel

TASK: OPERATE RICHARD'S BENDER
Must understand the tempering properties of steel

TASK: OPERATE WHEEL & BRADEN SHOT-BLAST MACHINE
Must understand the tempering properties of steel

File: TASK TECH
Report: GEROY

TASK: OPERATE BLACK OXIDE LINE
Must understand the tempering properties of steel

TASK: OPERATE STRAIGHTENING PRESS
Must understand the tempering properties of steel

TASK: OPERATE LAPPING MACHINE
Must understand the tempering properties of steel

TASK: SET UP POTTER & JOHNSON AC
none

TASK: OPERATE POTTER & JOHNSON AC
none

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File:   TASK TECH
Report: GEROY

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE
none



TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE
none



TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE
none



TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE
none



TASK: SET UP WARNER SWAZY AC LATHE
none
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File: TASK TECH
Report: GEROY

TASK: OPERATE WARNER SWAZY AC LATHE
none

TASK: SET UP 4-6 SPINDLE GANG DRILL
none

TASK: OPERATE 4-6 SPINDLE GANG DRILL
none

TASK: SHARPEN TOOLS
none

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE
none

File: TASK TECH
Report: GEROY

TASK: OPERATE HEAVY DUTY VERTICAL DRILLING MACHINE
none

TASK: SET UP RADIAL DRILL PRESS
none

TASK: OPERATE RADIAL DRILL PRESS
none

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS
none

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS
none

File: TASK TECH
Report: GEROY

TASK: SET UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
none

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
none

TASK: OPERATE CNC OKATA MILLING MACHINE
none

TASK: OPERATE CNC BRIDGEPORT MILLING MACHINE
none

TASK: SET UP CNC OKATA MILLING MACHINE
Understand basic principals of CNC programming

File: TASK TECH
Report: GEROY

TASK: SET UP CNC BRIDGEPORT MILLING MACHINE
Understand basic principals of CNC programming

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
none

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
none

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE
none

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE
none

File: TASK TECH
Report: GEROY

TASK: SET UP CINCINNATI RISE AND FALL
none

TASK: OPERATE CINCINNATI RISE AND FALL
none

TASK: SET UP DUPLEX-TWIN MILL
none

TASK: OPERATE DUPLEX-TWIN MILL
none

TASK: SET UP MILWAUKEE MATIC EB
none

File: TASK TECH
Report: GEROY

TASK: OPERATE MILWAUKEE MATIC EB
none

TASK: SET UP CNC MACHINE LATHE
none

TASK: OPERATE CNC MACHINE LATHE
none

TASK: SET UP CNC COMBI-LATHE
none

TASK: OPERATE CNC COMBI-LATHE
none

File: TASK TECH
Report: GEROY

TASK: SET UP K & T 180 INDEXES
none

TASK: OPERATE K & T 180 INDEXES
none

TASK: SET UP SCIMMX
none

TASK: OPERATE SCIMMX
none

TASK: SET UP DO ALL SAW
none

File: TASK TECH
Report: GEROY

TASK: OPERATE DO ALL SAW
none

TASK: SET UP A LINES LATHE
none

TASK: OPERATE A LINES LATHE
none

TASK: SET UP WAGNER SAW
none

TASK: OPERATE WAGNER SAW
none

File: TASK TECH
Report: GEROY

TASK: SET UP BARBER COLEMAN HOBB-GEAR MAKING MACHINE
none

TASK: OPERATE BARBER COLEMAN HOBB-GEAR MAKING MACHINE
none

TASK: SET UP ANVILL MILL
none

TASK: OPERATE ANVILL MILL
none

TASK: SET UP VERTICAL BROACHES
none

File: TASK TECH
Report: GEROY

TASK: OPERATE VERTICAL BROACHES
none

TASK: SET UP MSO MACHINE
none

TASK: OPERATE MSO MACHINE
none

TASK: SET UP BURKE TWIN MILL
none

TASK: OPERATE BURKE TWIN MILL
none

File: TASK TECH
Report: GEROY

TASK: OPERATE VIBRO
none

TASK: OPERATE OVERBECK GRINDER
none

TASK: SET UP GEAR SHAPER
none

TASK: OPERATE GEAR SHAPER
none

TASK: SET UP ENGINE LATHES
none

File: TASK TECH
Report: GEROY

TASK: OPERATE ENGINE LATHES
none

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES
none

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES
none

TASK: SET UP AUTOMATIC SCREW MACHINE
none

TASK: OPERATE AUTOMATIC SCREW MACHINE
none

File: TASK TECH
Report: GEROY

TASK: OPERATE BUFFING LATHE
Understand the polishing properties of steel

TASK: OPERATE DIE GRINDER
Understand the polishing properties of steel

TASK: OPERATE DISC SANDER
Understand the polishing properties of steel

TASK: OPERATE BETA MACHINE
Understand the polishing properties of steel

TASK: OPERATE FLOAT SANDER
Understand the polishing properties of steel

File: TASK TECH
Report: GEROY

TASK: OPERATE SPRAY GUNS
Understand the polishing properties of steel

TASK: OPERATE POWDER COATING ROOM
Understand the polishing properties of steel

TASK: OPERATE SPIN FINISH MACHINE
Understand the polishing properties of steel
Understand the various media used in the Spin machine

TASK: OPERATE SWECO
Understand the polishing properties of steel

TASK: OPERATE A BARREL MACHINE TUMBLER
Understand the polishing properties of steel

File: TASK TECH
Report: GEROY

TASK: OPERATE A PARTS WASHER
Understand the polishing properties of steel

TASK: OPERATE A DERUST WASH
Understand the polishing properties of steel

TASK:

TASK: SET UP HEALD MODEL 272 SIZEMATIC GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 272 SIZEMATIC GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

SECTION XI

PROCEDURAL KNOWLEDGE ASSOCIATED WITH EACH TASK

What procedural knowledge is
required by each task?

File: TASK PROCDR
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE
Run
Unload
Inspect
Readjust

TASK: OPERATE STANDARD END PLATE FINISHING LATHE
Run
Unload
Inspect
Readjust, if necessary

TASK: OPERATE DRILL PRESS
Run
Unload
Inspect
Readjust, if necessary

TASK: OPERATE BRIDGEPORT MILLING MACHINE
Run
Unload
Inspect
Readjust, if necessary

TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)
Obtain tooling and prints
Set-up sheets, gages and tape control
Adjust and calibrate machine
Install tape
Run
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)
Run
Unload
Inspect
Readjust (if necessary)

TASK: SET UP STANDARD END PLATE FINISHING LATHE
Obtain tooling and prints
Obtain setup sheets
Obtain gages
Adjust and calibrate
Run a job
Inspect for quality

TASK: OPERATE STANDARD END PLATE FINISHING LATHE
Run
Unload
Inspect
Readjust, if necessary

TASK: SET UP DRILL PRESS
Obtain tooling and prints
Obtain set up sheets
Obtain gages
Adjust and calibrate machine
Run a job
Inspect for quality

TASK: OPERATE DRILL PRESS
Run
Unload
Inspect
Readjust, if necessary

File: TASK PROCDR
Report: GEROY

TASK: SET UP BRIDGEPORT MILLING MACHINE
Obtain tooling and prints
Obtain gages
Obtain set up sheets
Adjust and calibrate machine
Run a job
Inspect for quality

TASK: OPERATE BRIDGEPORT MILLING MACHINE
Run
Unload
Inspect
Readjust, if necessary

TASK: SET UP SUNNEN HORIZONTAL HONE
Obtain WIP forms
Obtian gaging
Select proper mandrel and honing stone
Inspect stone
Replace stone if necessary
Run
Inspect
Readjust if necessary

TASK: OPERATE SUNNEN HORIZONTAL HONE
Load part
Run
Unload part
Inspect for quality
Readjust if necessary
Replace stone, if necessary

TASK: MAINTAIN CRIB SERVICE
Dispense and monitor tool signout

File: TASK PROCDR
Report: GEROY

TASK: MAINTAIN INVENTORY OF TOOLS
Identify which tools are needed
Complete a requisition for required tools
Submit a requisition

TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE KO SURFACE GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE HEALD TOOL GRINDING MACHINE
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE NORTON SURFACE GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

```
File:   TASK PROCDR
Report: GEROY

TASK: OPERATE DRILL GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect


TASK: OPERATE SURFACE GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect


TASK: OPERATE HOBB MACHINE
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect


TASK: OPERATE CUTTER AND TOOL GRINDING MACHINE
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect


TASK: OPERATE TAP GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect
```

File: TASK PROCDR
Report: GEROY

TASK: OPERATE THREAD CHASER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE GLEASON CUTTER-SHAPER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE SINGLE-POINT CARBIDE GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE SUNNEN PRECISION HONING MACHINE
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate machine
Run
Inspect

TASK: OPERATE DRILL PRESS
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

File: TASK PROCDR
Report: GEROY

TASK: OPERATE MILLING MACHINES
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

TASK: OPERATE JIG BORE
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

TASK: OPERATE SURFACE GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

TASK: OPERATE BENCH GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

TASK: OPERATE CONTOUR SAW
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

File: TASK PROCDR
Report: GEROY

TASK: OPERATE CAM GRINDER
Obtain prints
Obtain tooling
Obtain gaging
Attach work
Attach tooling
Adjust and calibrate
Run
Inspect

TASK: SET UP LANDIS EXTERNAL GRINDER
Obtain WIP form and blueprints
Attach tools
Select feeds
Attach fixture
Load stock
Set speeds and rate of traverse
Balance and dress wheels
Run
Inspect for quality
Readjust if necessary
TASK: OPERATE LANDIS EXTERNAL GRINDER
Load
Unload
Inspect for quality

TASK: SET UP NORTON EXTERNAL GRINDER
Obtain WIP form and blueprints
Attach tools
Select feeds
Attach fixture
Load stock
Set speeds and rate of traverse
Balance and dress wheels
Run
Inspect for quality
Readjust if necessary
TASK: OPERATE NORTON EXTERNAL GRINDER
Load
Unload
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: SET UP GARDNER DISK GRINDER
Obtain WIP form and blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL
Load
Unload
Inspect for quality

TASK: SET UP CINCINNATI THRU FEED GRINDER
Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE CINCINNATI THRU FEED GRINDER
Load
Unloads
Inspect for quality

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER
Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

File: TASK PROCDR
Report: GEROY

TASK: SET UP HEALD MODEL 271 GRINDER
Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE HEALD MODEL 271 GRINDER
Load
Unload
Inspect for quality

TASK: SET UP HEALD MODEL 272 GRINDER
Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE HEALD MODEL 272 GRINDER
Load
Unload
Inspect for quality

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER
Load
Unload
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK:SET UP CINCINNATI MODEL 181 GRINDER
Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE CINCINNATI MODEL 181 GRINDER
Load
Unload
Inspect for quality

TASK: SET UP EXTERNAL STEPMASTER GRINDER
Obtain WIP form
Obtain blueprints
Write program for programmable control
Attach tools
Load stock
Run
Inspect for quality
Readjust if necessary

TASK: OPERATE EXTERNAL STEPMASTER GRINDER
Load
Unload
Inspect for quality

TASK: SET UP ROTARY VERTICAL SPINDLE
Obtain WIP form
Obtain blueprints
Attach tools
Select feeds
Attach fixture
Load stock
Set speeds and rate of traverse
Balance and dress wheels
Run
Inspect quality and adjust if necessary

File: TASK PROCDR
Report: GEROY

TASK: OPERATE ROTARY VERTICAL SPINDLE
Load
Unload
Inspect for quality

TASK: ASSEMBLE COMPONENTS FOR TOOLS
Obtain assembly order
Obtain parts
Assemble components

TASK: OPERATE ROBOT TEST CELL
Set up for product
Set up fixtures
Program robot
Make switch adjustments
Make Gripper switch adjustments
Maintain standards in the cell

TASK: STAMP IDENTIFICATION NUMBER ON PARTS
Select dies
Strike die with hammer

TASK: OPERATE ROLL STAMP
Select proper fixture
Select anchor
Select stamps
Set length of travel and pressure

File: TASK PROCDR
Report: GEROY

TASK: OPERATE POWER PRESS
Load parts
Run
Unload

TASK: ASSEMBLE TWO OR MORE PARTS
Obtain parts
Assemble

TASK: SET UP STANDARD HEALD BOREMATIC MACHINE
Obtain WIP form, tooling and gages
Change Collet and Index Plate
Change Drills and Boring bars
Change Reamers and Set Feeds
Set Speeds and Stops
Adjust Milling head
Load parts/Run machine/Unload parts
Inspect for quality
Readjust machine if necessary

TASK: OPERATE A STANDARD HEALD BOREMATIC MACHINE
Load work
Run
Unload
Inspect for quality

TASK: SET UP HEALD BOREMATIC PIN MACHINE
Obtain WIP, tooling and gages
Change Collet and Index plate
Change Drills and Boring bars
Change Reamers and Set Feeds
Set Speeds and Stops
Adjust Milling Head
Load parts/Run machine/Unload parts
Inspect for quality
Readjust if necessary

File: TASK PROCDR
Report: GEROY

TASK: OPERATE A HEALD BOREMATIC PIN MACHINE
Load work
Run
Unload
Inspect for quality

TASK: SET UP TRANSFER MACHINE
Obtain blueprints
Obtain set up sheets
Preset drills
Adjust heads
Preset mill ends
Change jaws and jobs
Adjust brackets/Sharpen tools
Run
Inspect for quality
Readjust if necessary
TASK: OPERATE TRANSFER MACHINE
Load parts
Unload parts
Inspect

TASK: SET UP JONES AND LAMSON ATL
Obtain WIP, blueprints, tooling
Attach and Adjust Tools
Load
Run
Unload
Inspect parts for quality

TASK: OPERATE JONES AND LAMSON ATL
Load work
Run
Unload
Inspect

File: TASK PROCDR
Report: GEROY

TASK: SET UP MSO
Obtain WIP, blueprints, tooling
Attach and Adjust tools
Load
Run
Unload
Inspect parts for quality

TASK: OPERATE MSO
Load work
Run
Unload
Inspect

TASK: OPERATE FURNACE (LABOR GRADE 4)
Blow off internal parts
Burnout Heat-Treat generator
Add quench oil
Grease fitting
Oil air line oilers
Add make-gas
Put gas in furnace
Make up and unload loads
Adjust and set computer
Set manual instruments
TASK: OPERATE FURNACE (LABOR GRADE 3)
Blow off internal parts
Burnout Heat-Treat generator
Add quench oil
Grease fitting
Oil air line oilers
Add make-gas/ Put gas in furnace
Make up and unload loads
Adjust and set computer and manual instruments
Troubleshoot problems in the system
Assist the other furnace operators
TASK: OPERATE FORGE FURNACE
Open valves (air & gas)
Heat to proper temperatures
Install proper plates
Load
Maintain proper settings
Unload

File: TASK PROCDR
Report: GEROY

TASK: OPERATE UPSET HAMMER
Select dies
Set dies for proper dimensions
Load
Unload
Inspect for quality
Adjust dies if necessary

TASK: OPERATE RICHARD'S BENDER
Set up dies
Set up stops
Bend parts to center radius
Offset parts

TASK: OPERATE WHEEL & BRADEN SHOT-BLASTER MACHINE
Load parts
Set timer
Blast parts
Unload

TASK: OPERATE BLACK OXIDE LINE
Load parts
Load black and oil
Unload parts
Monitor tank temperature

TASK: OPERATE STRAIGHTENING PRESS
Adjust pressures
Select centers
Set up centers
Set up support block
Load and Unload

File: TASK PROCDR
Report: GEROY

TASK: OPERATE LAPPING MACHINE
Select mount wheels
Select carbides
Select centers
Load
Unload

TASK: SET UP POTTER & JOHNSON AC
Obtain tooling
Obtain blueprints, Set-up sheets and gages
Adjust and calibrate machine
Attach tools
Fix work
Run
Inspect
Readjust, if necessary

TASK: SET UP SEIKI MODEL 4 NE CNC LATHE
Obtain tooling
Obtain blueprints, Set-up sheets and gages
Adjust and calibrate machine
Attach tools
Fix work
Run
Inspect
Readjust, if necessary

TASK: SET UP SEIKI MODEL 4 NEA CNC LATHE
Obtain tooling
Obtain blueprints, Set-up sheets and gages
Adjust and calibrate machine
Attach tools
Fix work
Run
Inspect
Readjust, if necessary

TASK: SET UP WARNER SWAZY AC LATHE
Obtain tooling
Obtain blueprints, Set-up sheets and gages
Adjust and calibrate machine
Attach tools
Fix work
Run
Inspect
Readjust, if necessary

File: TASK PROCDR
Report: GEROY

TASK: OPERATE POTTER & JOHNSON AC
Load parts
Run
Unload parts
Inspect for quality

TASK: OPERATE SEIKI MODEL 4 NE CNC LATHE
Load parts
Run
Unload parts
Inspect for quality

TASK: OPERATE SEIKI MODEL 4 NEA CNC LATHE
Load parts
Run
Unload parts
Inspect for quality

TASK: OPERATE WARNER SWAZY AC LATHE
Load parts
Run
Unload parts
Inspect for quality

TASK: SET UP 4-6 SPINDLE GANG DRILL
Obtain blueprints
Obtain WIP
Obtain drills
Set Speeds
Fix tools Adjust
Obtain reamers

File: TASK PROCDR
Report: GEROY

TASK: OPERATE 4-6 SPINDLE GANG DRILL
Run a piece
Inspect for quality

TASK: SHARPEN DRILLS
Fasten drill in holder
Adjust grind angle
Run

TASK: SET UP HEAVY DUTY VERTICAL DRILLING MACHINE
Locate fixtures, blueprints, and WIP
Obtain gages and tooling
Set-up drill press
Run
Inspect for quality

TASK: SET UP RADIAL DRILL PRESS
Locate fixtures, blueprints, and WIP
Obtain gages and tooling
Set-up drill press
Run
Inspect for quality

TASK: SET UP NATCO MULTI-SPINDLE DRILL PRESS
Locate fixtures, blueprints, and WIP
Obtain gages and tooling
Set-up drill press
Run
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: SET UP 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Locate fixtures, blueprints, and WIP
Obtain gages and tooling
Set-up drill press
Run
Inspect for quality

TASK: OPERATE RADIAL DRILL PRESS
Load parts
Run
Unload parts
Inspect for quality
Adjust if necessary

TASK: OPERATE NATCO MULTI-SPINDLE DRILL PRESS
Load parts
Run
Unload parts
Inspect for quality
Adjust if necessary

TASK: OPERATE 24" UPRIGHT SINGLE SPINDLE DRILL PRESS
Load parts
Run
Unload parts
Inspect for quality
Adjust if necessary

TASK: OPERATE CNC OKATA MILLING MACHINE
Load work
Run
Unload work
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: OPERATE CNC BRIDGEPORT MILLING MACHINE
Load work
Run
Unload work
Inspect for quality

TASK: OPERATE CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Load work
Run
Unload work
Inspect for quality

TASK: OPERATE BRIDGEPORT VERTICAL MILLING MACHINE
Load work
Run
Unload work
Inspect for quality

TASK: OPERATE CINCINNATI RISE AND FALL
Load work
Run
Unload work
Inspect for quality

TASK: OPERATE DUPLEX-TWIN MILL
Load work
Run
Unload work
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: SET UP CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

TASK: SET UP BRIDGEPORT VERTICAL MILLING MACHINE
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

TASK: SET UP CINCINNATI RISE AND FALL
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

TASK: SET UP DUPLEX-TWIN MILL
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

TASK: SET UP CNC OKATA MILLING MACHINE
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

File: TASK PROCDR
Report: GEROY

TASK: SET UP CNC BRIDGEPORT MILLING MACHINE
Obtain WIP forms, blueprints, tape and tooling
Fix tooling
Attach fixture
Adjust machine
Select speeds and feeds
Line-up
Run
Inspect for quality
Readjust, if necessary

TASK: SET UP MILWAUKEE MATIC EB
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP CNC MACHINE LATHE
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP CNC COMBI-LATHE
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP K & T 180
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

File: TASK PROCDR
Report: GEROY

TASK: SET UP SCIMMX
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP DO ALL SAW
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP A LINES LATHE
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: SET UP SEIKI LATHE(S)
Obtain WIP forms, Blueprints, Tooling, and Gaging
Attach fixtures
Attach tools
Mount work
Adjust machine
Load tape
Run
Inspect for quality
Adjust, if necessary

TASK: OPERATE MILWAUKEE MATIC EB
Load
Unload
Inspect for quality
Change tools

File: TASK PROCDR
Report: GEROY

TASK: OPERATE CNC MACHINE LATHE
Load
Unload
Inspect for quality
Change tools

TASK: OPERATE COMBI-LATHE
Load
Unload
Inspect for quality
Change tools

TASK: OPERATE K & T 180
Load
Unload
Inspect for quality
Change tools

TASK: OPERATE SCIMMX
Load
Unload
Inspect for quality
Change tools

TASK: OPERATE DO ALL SAW
Load
Unload
Inspect for quality
Change tools

File: TASK PROCDR
Report: GEROY

TASK: OPERATE A LINES LATHE
Load
Unload
Inspect for quality
Change tools

TASK: OPERATE SEIKI LATHE(S)
Load
Unload
Inspect for quality
Change tools

TASK:SET UP WAGNER SAW
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

TASK: SET UP BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

TASK: SET UP ANVILL MILL
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

File: TASK PROCDR
Report: GEROY

TASK: SET UP VERTICAL BROACHES
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

TASK: SET UP MSO MACHINE
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

TASK: SET UP BURKE TWIN MILL
Obtain WIP form
Obtain tooling, gaging, and blueprints
Install tooling
Install bore jaws
Install tape
Make offsets
Inspect for quality
Adjust, if necessary

TASK: OPERATE WAGNER SAW
Load
Unload
Inspect for quality
Readjust machine, if necessary

TASK: OPERATE BARBER COLEMAN HOBB-GEAR MAKING MACHINE
Load
Unload
Inspect for quality
Readjust machine, if necessary

File: TASK PROCDR
Report: GEROY

TASK: OPERATE ANVILL MILL
Load
Unload
Inspect for quality
Readjust machine, if necessary

TASK: OPERATE VERTICAL BROACHES
Load
Unload
Inspect for quality
Readjust machine, if necessary

TASK: OPERATE MSO MACHINE
Load
Unload
Inspect for quality
Readjust machine, if necessary

TASK: OPERATE BURKE TWIN MILL
Load
Unload
Inspect for quality
Readjust machine, if necessary

TASK: OPERATE SEIKI LATHE(S)
Load
Unload
Inspect for quality
Readjust machine, if necessary

File: TASK PROCDR
Report: GEROY

TASK: OPERATE VIBRO
Select and Load Media
Set pressures
Load work
Run
Unload work

TASK: OPERATE OVERBECK GRINDER
Select and mount stone
Run

TASK: SET UP MULTIPLE SPINDLE SCREW MACHINES
Obtain prints, tooling, gaging and WIP forms
Fix tools
Adjust and calibrate machine
Run
Inspect for quality

TASK: SET UP AUTOMATIC SCREW MACHINES
Obtain prints, tooling, gaging and WIP forms
Fix tools
Adjust and calibrate machine
Run
Inspect for quality

TASK: SET UP GEAR SHAPER
Obtain prints, tooling, gaging and WIP forms
Fix tools
Adjust and calibrate machine
Run
Inspect for quality

File: TASK PROCDR
Report: GEROY

TASK: OPERATE GEAR SHAPER

Load
Unload
Inspect for quality
Readjust machine if necessary

TASK: OPERATE MULTIPLE SPINDLE SCREW MACHINES

Load
Unload
Inspect for quality
Readjust machine if necessary

TASK: OPERATE AUTOMATIC SCREW MACHINE

Load
Unload
Inspect for quality
Readjust machine if necessary

TASK: OPERATE SWECO

Set weights
Set timing
Adjust compounds
Set water pressure
Set compound flow
Select media
Load parts
Unload parts
Inspect

TASK: OPERATE A BARREL MACHINE TUMBLER

Load
Add compound
Add water
Set timer
Unload
Rust protect

File: TASK PROCDR
Report: GEROY

TASK: OPERATE A BIG WASH

Load
Wash
Rinse
Blow out
Restack
Ship

TASK: OPERATE A DERUST WASH

Load
Wash
Rinse
Blow out
Restack
Ship

TASK: OPERATE SPIN FINISH MACHINE

Loacte fixture
Load parts
Change head bolts
Replace head bolts
Replace tension springs
Load media
Set time levels
Run
Unload

TASK: OPERATE PAINT BOOTH

Obtain WIP forms
Select proper powder
Load powder
Attach guns
Operate

TASK: OPERATE POWDER COATING ROOM

Obtain WIP forms
Turn on furnaces
Turn on water
Turn on heat
Mask parts
Load parts
Operate spray equipment
Change colors

File: TASK PROCDR
Report: GEROY

TASK: OPERATE BUFFING LATHE
Obtain WIP forms
Select wheel
Adjust wheel
Select belts
Run
Clean work area

TASK:OPERATE DIE GRINDER
Obtain WIP form
Fasten tool
Attach air supply
Run

TASK: OPERATE DISC SANDER
Obtain WIP form
Select sandpaper
Attach sandpaper
Operate

TASK: OPERATE BETA MACHINE
Obtain WIP form
Select grinding wheel
Attach grinding wheel
Adjust machine
Run

TASK: OPERATE FLOAT SANDER
Obtain WIP form
Select sandpaper
Attach sandpaper
Operate

File: TASK PROCDR
Report: GEROY

TASK: SET UP HEALD SIZEMATIC GRINDER

Obtain WIP form
Obtain blueprints
Attach tools
Attach fixture
Load stock
Set speeds
Run Inspect for quality
Readjust, if necessary

TASK: OPERATE HEALD SIZEMATIC GRINDER

Load
Unload
Inspect for quality

File: TASK SYS
Report: GEROY

TASK: OPERATE DIE GRINDER
Know when to replace wheels
Adjust belts
Identify malfunctioning system on machine
Requisition service for machine
Identify type of wheels to use

TASK: OPERATE DISC SANDER
Must know when to replace sandpaper
Identify problems with machine
Requisition service for machine

TASK: OPERATE BETA MACHINE
Obtain WIP form
Select grinding wheel
Attach grinding wheel
Adjust machine
Run

TASK: OPERATE FLOAT SANDER
Must know when to replace sandpaper
Identify problems with the machine
Requisition service for the machine

Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

August 1987

Volume 4

Appendices A - I

Sample Data Base Sorts

The Pennsylvania State University

Division of Counseling and Educational Psychology
and Career Studies

ANALYSIS PROFILES

APPENDICES A-I

The following printouts are designed to give an example of what type data that can be generated from the task and/or machine data bases.

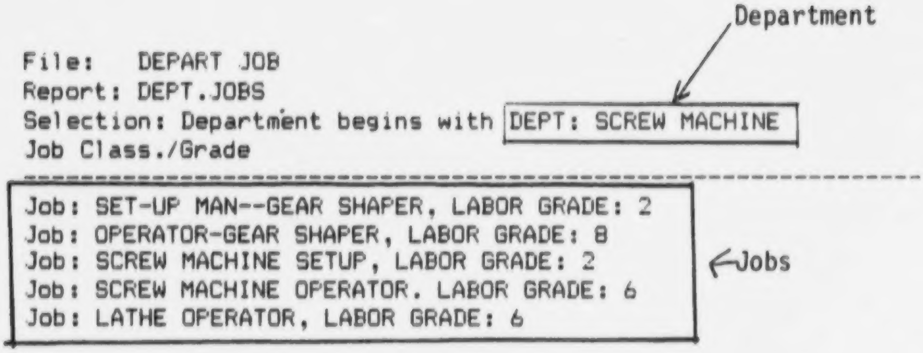
These listings are by no means exhaustive since printing out every possible configuration would produce voluminous array of information.

Additional sorts and/or configurations are available upon request.

APPENDIX A

JOBS: DEPARTMENT

What jobs are in which department?



Department

```
File:   DEPART JOB
Report: DEPT.JOBS
Selection: Department begins with DEPT: SCREW MACHINE
Job Class./Grade
------------------------------------------------------------------
Job: SET-UP MAN--GEAR SHAPER, LABOR GRADE: 2
Job: OPERATOR-GEAR SHAPER, LABOR GRADE: 8
Job: SCREW MACHINE SETUP, LABOR GRADE: 2
Job: SCREW MACHINE OPERATOR. LABOR GRADE: 6
Job: LATHE OPERATOR, LABOR GRADE: 6
```

Jobs

```
File:   DEPART JOB
Report: DEPT.JOBS
Selection: Department begins with DEPT: HEAT TREAT
Job Class./Grade
--------------------------------------------------------------
Job: FURNACE OPERATOR/LEADER, LABOR GRADE: 3
Job: FURNACE OPERATOR, LABOR GRADE: 4
Job: FINISHER-CLASS 1, LABOR GRADE: 4
Job: BLACKSMITH, LABOR GRADE: 3
```

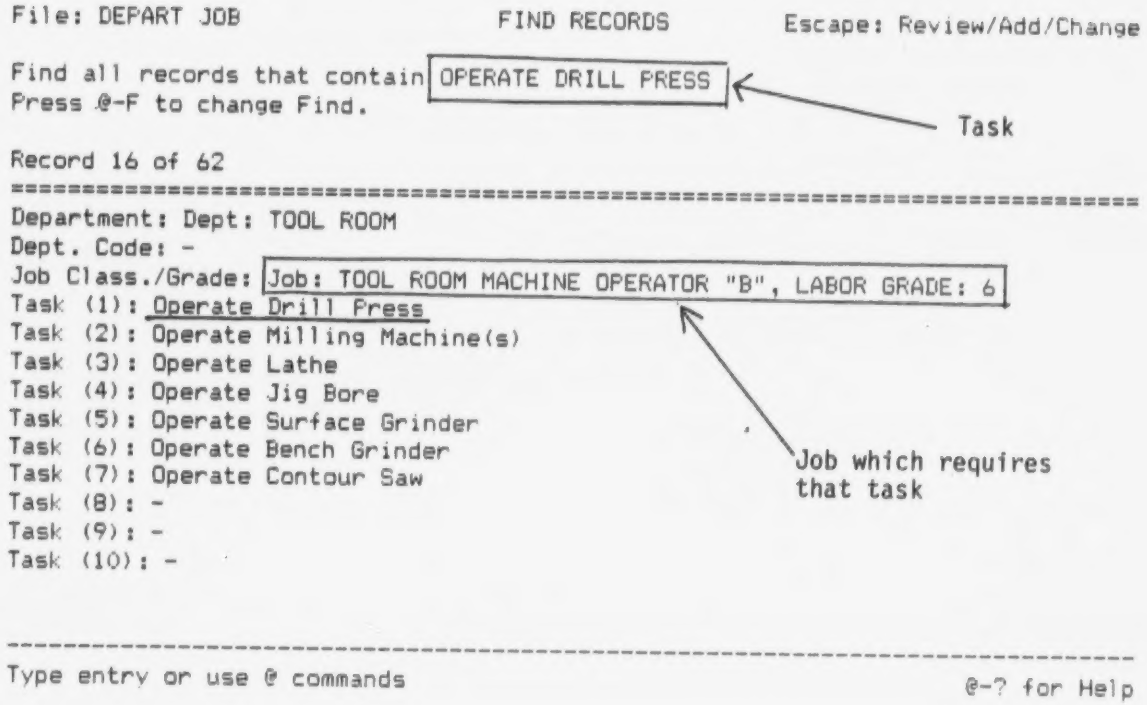
```
File:   DEPART JOB
Report: DEPT.JOBS
Selection: Department begins with DEPT: TOOL ROOM
Job Class./Grade
-----------------------------------------------------------------
Job: CRIB KEEPER, LABOR GRADE: 6
Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4
Job: GRINDER-TOOL (CARBIDE), LABOR GRADE: 4
Job: GRINDER-TOOL, LABOR GRADE: 3
Job: GRINDER-TOOL, LABOR GRADE: 3
Job: GRINDER-TOOL, LABOR GRADE: 4
Job: GRINDER-TOOL, LABOR GRADE: 4
Job: GRINDER-TOOL, LABOR GRADE: 6
Job: GRINDER-TOOL, LABOR GRADE: 6
Job: GRINDER-TOOL, LABOR GRADE: 8
Job: GRINDER-TOOL, LABOR GRADE: 8
Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5
Job: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6
Job: TOOL AND DIE MAKER, LABOR GRADE: 3
Job: TOOL AND DIE MAKER, LABOR GRADE 1
```

```
File:   DEPART JOB
Report: DEPT.JOBS
Selection: Department begins with DEPT: GRINDING
Job Class./Grade
---------------------------------------------------------------
Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4
Job: DOUBLE DISK GRINDER OPERATOR, LABOR GRADE: 4
Job: GRINDER OPERATOR CENTERLESS, LABOR GRADE: 4
Job: GRINDER OPERATOR INTERNAL, LABOR GRADE: 4
Job: EXTERNAL GRINDER, LABOR GRADE: 4
Job: GRINDER OPERATOR SURFACE, LABOR GRADE: 6
```

APPENDIX B

JOBS: TASKS

Which _jobs_ require this _task_?



```
File: DEPART JOB                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS
Press @-F to change Find.

Record 16 of 62
===============================================================================
Department: Dept: TOOL ROOM
Dept. Code: -
Job Class./Grade: Job: TOOL ROOM MACHINE OPERATOR "B", LABOR GRADE: 6
Task (1): Operate Drill Press
Task (2): Operate Milling Machine(s)
Task (3): Operate Lathe
Task (4): Operate Jig Bore
Task (5): Operate Surface Grinder
Task (6): Operate Bench Grinder
Task (7): Operate Contour Saw
Task (8): -
Task (9): -
Task (10): -

-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

Task

Job which requires that task

```
File: DEPART JOB                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain SET UP LANDIS EXTERNAL GRINDE
Press @-F to change Find.

Record 19 of 62
================================================================================
Department: Dept: GRINDING DEPARTMENT
Dept. Code: -
Job Class./Grade: Job: GRINDER OPERATOR EXTERNAL, LABOR GRADE 4
Task (1): Set up Landis External Grinder
Task (2): Operate Landis External Grinder
Task (3): Set up Norton External Grinder
Task (4): Operate Norton External Grinder
Task (5): -
Task (6): -
Task (7): -
Task (8): -
Task (9): -
Task (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain SET UP ANVILL MILL
Press @-F to change Find.

Record 50 of 62
==============================================================================
Department: Dept: TURNING CENTER DEPARTMENT
Dept. Code: -
Job Class./Grade: Job: TURNING MACHINE CENTER SETUP & OPERATOR, LG: 2
Task (1): Set up Wagner Saw
Task (2): Operate Wagner Saw
Task (3): Set up Barber Coleman Hobb-Gear Making Machine
Task (4): Operate Barber Coleman Hobb-Gear Making Machine
Task (5): Set up Anvill Mill
Task (6): Operate Anvill Mill
Task (7): Set up Vertical Broaches
Task (8): Operate Vertical Broaches
Task (9): Set up MSO Machine
Task (10): *****CONTINUED BELOW******


------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: DEPART JOB                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET UP ANVILL MILL
Press @-F to change Find.

Record 52 of 62
===============================================================================
Department: Dept: TURNING CENTER DEPARTMENT
Dept. Code: -
Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4
Task (1): Set up Wagner Saw
Task (2): Operate Wagner Saw
Task (3): Set up Barber Coleman Hobb-Gear Making Machine
Task (4): Operate Barber Coleman Hobb-Gear Making Machine
Task (5): Set up Anvill Mill
Task (6): Operate Anvill Mill
Task (7): Set up Vertical Broaches
Task (8): Operate Vertical Broaches
Task (9): Set up MSO Machine
Task (10): ******CONTINUED BELOW********


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: DEPART JOB                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE MSO MACHINE
Press @-F to change Find.

Record 34 of 62
===============================================================================
Department: Dept: TRANSFER LINE
Dept. Code: -
Job Class./Grade: Job: TRANSFER LINE OPERATOR, LABOR GRADE: 2
Task (1): Set up Transfer Machine
Task (2): Operate Transfer Machine
Task (3): Set up for J & L ATL
Task (4): Operate J & L ATL
Task (5): Set up MSO Machine
Task (6): Operate MSO Machine
Task (7): -
Task (8): -
Task (9): -
Task (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE MSO MACHINE
Press @-F to change Find.

Record 51 of 62
==============================================================================
Department: Dept: TURNING CENTER DEPARTMENT
Dept. Code: -
Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 2
Task (1): *****CONTINUED FROM ABOVE*****
Task (2): Operate MSO Machine
Task (3): Set up Burke Twin Mill Machine
Task (4): Operate Burke Twin Mill Machine
Task (5): Set up Seiki Turning Machine
Task (6): -
Task (7): Operate Vibro
Task (8): Operate Overveck Grinder
Task (9): -
Task (10): -


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE MSO MACHINE
Press @-F to change Find.

Record 53 of 62
===============================================================================
Department: Dept: TURNING CENTER DEPARTMENT
Dept. Code: -
Job Class./Grade: Job: TURNING MACHINE CENTER SETUP AND OPERATOR, LG: 4
Task (1): *****CONTINUED FROM ABOVE*****
Task (2): Operate MSO Machine
Task (3): Set up Burke Twin Mill Machine
Task (4): Operate Burke Twin Mill Machine
Task (5): Operate Vibro
Task (6): Operate Overbeck Grinder
Task (7): -
Task (8): -
Task (9): -
Task (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE JIG GRINDER
Press @-F to change Find.

Record 17 of 62
===============================================================================
Department: Dept: TOOL ROOM
Dept. Code: -
Job Class./Grade: Job: TOOL AND DIE MAKER, LABOR GRADE: 3
Task (1): Operate Drill Press
Task (2): Operate Milling Machine(s)
Task (3): Operate Lathe
Task (4): Operate Vertical Shaper
Task (5): Operate Jig Bore
Task (6): Operate Surface Grinder
Task (7): Operate Cam Grinder
Task (8): Operate Jig Grinder
Task (9): -
Task (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: DEPART JOB                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE JIG GRINDER
Press @-F to change Find.

Record 18 of 62
================================================================================
Department: Dept: TOOL ROOM
Dept. Code: -
Job Class./Grade: Job: TOOL AND DIE MAKER, LABOR GRADE 1
Task (1): Operate Drill Press
Task (2): Operate Milling Machine(s)
Task (3): Operate Lathe
Task (4): Operate Jig Bore
Task (5): Operate Surface Grinder
Task (6): Operate Jig Grinder
Task (7): Operate Vertical Shaper
Task (8): Operate Cam Grinder
Task (9): -
Task (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: DEPART JOB                FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS
Press @-F to change Find.

Record 1 of 62
================================================================================
Department: Dept: PRECISION MACHINING CENTER
Dept. Code: -
Job Class./Grade: Job: OPERATOR, LABOR GRADE: 4
Task (1): Operate Seiki Automatic Turret Lathe
Task (2): Operate Standard End Plate Finishing Lathe
Task (3): Operate Drill Press
Task (4): Operate Bridgeport Milling Machine
Task (5): -
Task (6): -
Task (7): -
Task (8): -
Task (9): -
Task (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                         @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS
Press @-F to change Find.

Record 2 of 62
================================================================================
Department: Dept: PRECISION MACHINING CENTER
Dept. Code: -
Job Class./Grade: Job: SET UP PERSONNEL, LABOR GRADE: 2
Task (1): Set up Seiki Automatic Turret Lathe
Task (2): Operate Seiki Automatic Turret Lathe
Task (3): Set up Standard End Plate Finishing Lathe
Task (4): Operate Standard End Plate Finishing Lathe
Task (5): Set Up Drill Press
Task (6): Operate Drill Press
Task (7): Set Up Bridgeport Milling Machine
Task (8): Operate Bridgeport Milling Machine
Task (9): -
Task (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: DEPART JOB                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain OPERATE DRILL PRESS
Press @-F to change Find.

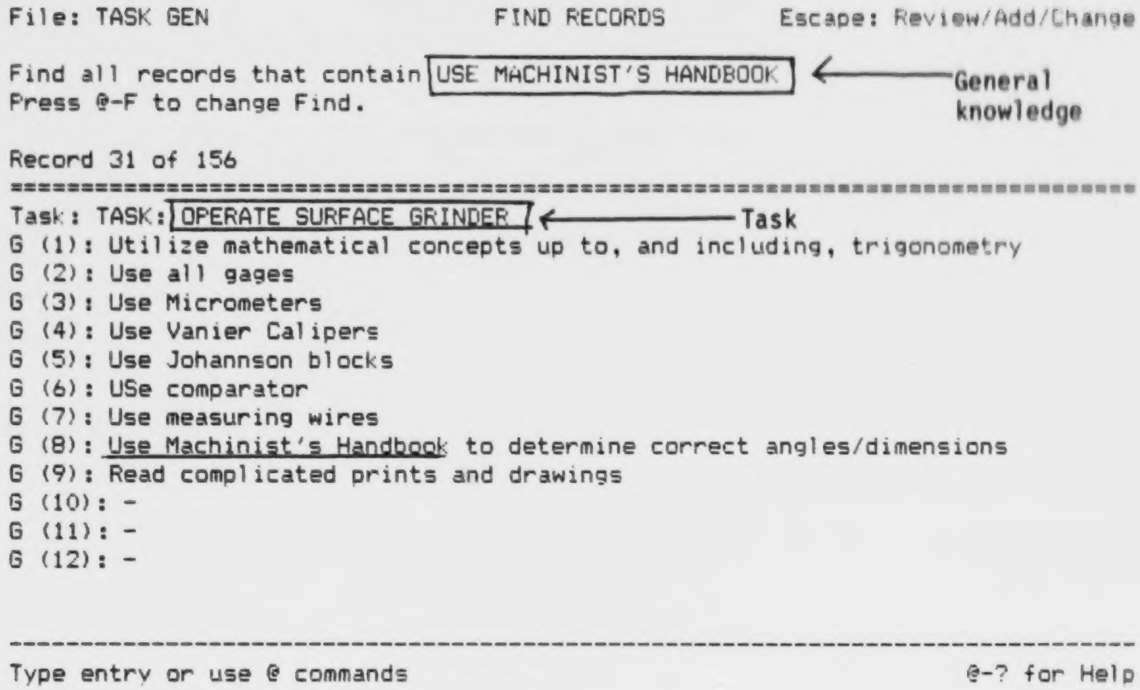
Record 15 of 62
===============================================================================
Department: Dept: TOOL ROOM
Dept. Code: -
Job Class./Grade: Job: TOOL ROOM MACHINE OPERATOR "A", LABOR GRADE: 5
Task (1): Operate Drill Press
Task (2): Operate Milling Machine(s)
Task (3): Operate Lathe
Task (4): Operate Jig Bore
Task (5): Operate Surface Grinder
Task (6): Operate Bench Grinders
Task (7): Operate Contour Saw
Task (8): -
Task (9): -
Task (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

APPENDIX C

GENERAL KNOWLEDGE: TASK

What tasks require this general knowledge?

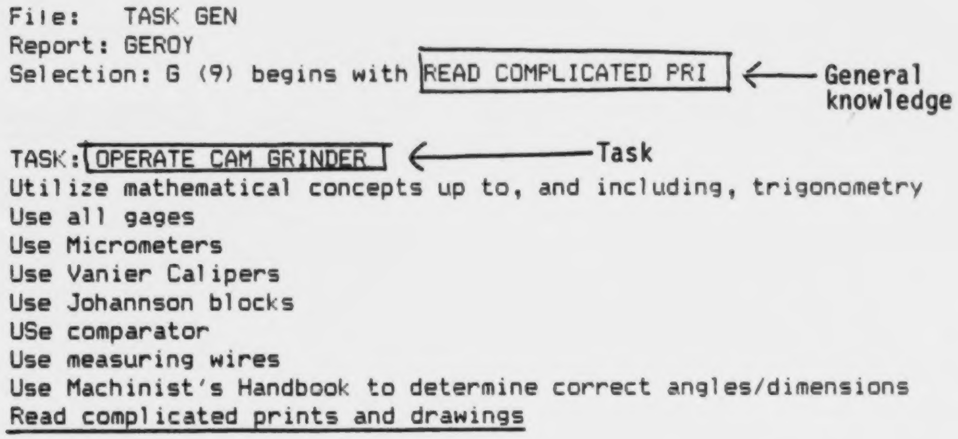


```
File: TASK GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain USE MACHINIST'S HANDBOOK
Press @-F to change Find.

Record 31 of 156
===============================================================================
Task: TASK: OPERATE SURFACE GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use Micrometers
G (4): Use Vanier Calipers
G (5): Use Johannson blocks
G (6): USe comparator
G (7): Use measuring wires
G (8): Use Machinist's Handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -

-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```



```
File:   TASK GEN
Report: GEROY
Selection: G (9) begins with READ COMPLICATED PRI

TASK: OPERATE CAM GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use Micrometers
Use Vanier Calipers
Use Johannson blocks
USe comparator
Use measuring wires
Use Machinist's Handbook to determine correct angles/dimensions
Read complicated prints and drawings
```

```
File:   TASK GEN
Report: GEROY
Selection: G (9) begins with READ COMPLICATED PRI


TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings



TASK: OPERATE KO SURFACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings



TASK: OPERATE HEALD TOOL GRINDING MACHINE
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings



TASK: OPERATE NORTON SURFACE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings
```

File: TASK GEN
Report: GEROY
Selection: G (9) begins with READ COMPLICATED PRI

TASK: OPERATE TAP GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE THREAD CHASER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE GLEASON CUTTER-SHAPER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

TASK: OPERATE SINGLE POINT CARBIDE GRINDER
Utilize mathematical concepts up to, and including, trigonometry
Use all gages
Use micrometers
Use Vernier calipers
Use Johannson Blocks
Use comparator
Use measuring wires
Use machinist's handbook to determine correct angles/dimensions
Read complicated prints and drawings

```
File: TASK GEN                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain USE COMPARATOR
Press @-F to change Find.

Record 22 of 156
================================================================================
Task: TASK: OPERATE TAP GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: TASK GEN                    FIND RECORDS         Escape: Review/Add/Change

Find all records that contain USE COMPARATOR
Press @-F to change Find.

Record 19 of 156
================================================================================
Task: TASK: OPERATE SURACE GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: TASK GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain USE COMPARATOR
Press @-F to change Find.

Record 14 of 156
===============================================================================
Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS
Press @-F to change Find.

Record 23 of 156
===============================================================================
Task: TASK: OPERATE THREAD CHASER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: TASK GEN                     FIND RECORDS       Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS
Press @-F to change Find.

Record 19 of 156
===============================================================================
Task: TASK: OPERATE SURACE GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: TASK GEN                   FIND RECORDS        Escape: Review/Add/Change

Find all records that contain USE JOHANNSON BLOCKS
Press @-F to change Find.

Record 14 of 156
=============================================================================
Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


-----------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: TASK GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain USE MACHINIST'S HANDBOOK
Press @-F to change Find.

Record 24 of 156
===============================================================================
Task: TASK: OPERATE GLEASON CUTTER-SHAPER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK GEN                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain USE MACHINIST'S HANDBOOK
Press @-F to change Find.

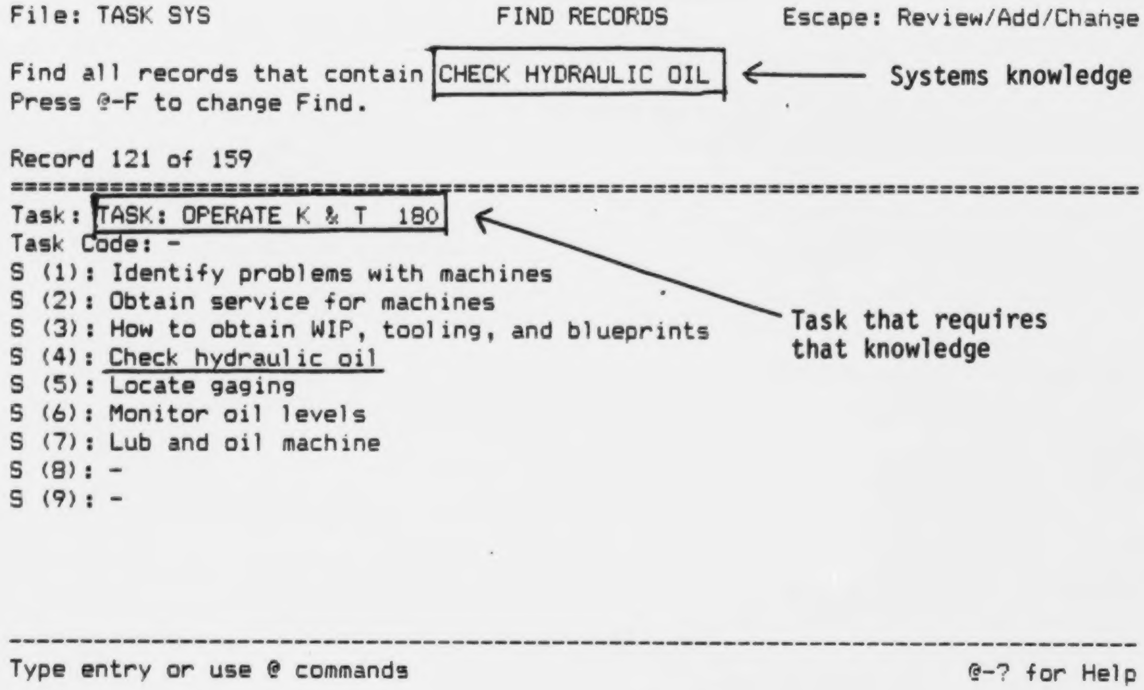
Record 18 of 156
==============================================================================
Task: TASK: OPERATE DRILL GRINDER
G (1): Utilize mathematical concepts up to, and including, trigonometry
G (2): Use all gages
G (3): Use micrometers
G (4): Use Vernier calipers
G (5): Use Johannson Blocks
G (6): Use comparator
G (7): Use measuring wires
G (8): Use machinist's handbook to determine correct angles/dimensions
G (9): Read complicated prints and drawings
G (10): -
G (11): -
G (12): -

------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

APPENDIX D

SYSTEMS KNOWLEDGE: TASK

What tasks require this systems knowledge?



```
File: TASK SYS                      FIND RECORDS        Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL
Press @-F to change Find.

Record 121 of 159
==============================================================================
Task: TASK: OPERATE K & T  180
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): Locate gaging
S (6): Monitor oil levels
S (7): Lub and oil machine
S (8): -
S (9): -


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

Systems knowledge

Task that requires that knowledge

```
File: TASK SYS                   FIND RECORDS        Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL
Press @-F to change Find.

Record 105 of 159
==============================================================================
Task: TASK: SET UP A CNC BRIDGEPORT MILLING MACHINE
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -




------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL
Press @-F to change Find.

Record 120 of 159
===============================================================================
Task: TASK: SET UP K & T 180
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): Locate gaging
S (6): Monitor oil levels
S (7): Lub and oil machine
S (8): -
S (9): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain CHECK HYDRAULIC OIL
Press @-F to change Find.

Record 119 of 159
==============================================================================
Task: TASK: OPERATE CNC COMBI-LATHE
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): Locate gaging
S (6): Monitor oil levels
S (7): Lub and oil machine
S (8): -
S (9): -



------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING
Press @-F to change Find.

Record 38 of 159
===============================================================================
Task: TASK: OPERATE CONTOUR SAW
Task Code: -
S (1): Identify malfunctioning systems of the machine
S (2): Obtain service for machine
S (3): Locate parts
S (4): Know the intended purpose of the workpiece
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING
Press @-F to change Find.

Record 27 of 159
===============================================================================
Task: TASK: OPERATE SINGLE POINT CARBIDE GRINDER
Task Code: -
S (1): Identify malfunctioning systems on the machine
S (2): Obtain service for machine
S (3): Locate prints
S (4): Know the intended purpose of the workpiece
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -




-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                   FIND RECORDS       Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTIONING
Press @-F to change Find.

Record 16 of 159
===============================================================================
Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Task Code: -
S (1): Identify malfunctioning systems on the machine
S (2): Obtain service for machine
S (3): Locate prints
S (4): Know the intended purpose of the workpiece
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS
Press @-F to change Find.

Record 16 of 159
===============================================================================
Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Task Code: -
S (1): Identify malfunctioning systems on the machine
S (2): Obtain service for machine
S (3): Locate prints
S (4): Know the intended purpose of the workpiece
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS
Press @-F to change Find.

Record 6 of 159
===============================================================================
Task: TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE(S)
Task Code: -
S (1): Identify malfunction system on the machine
S (2): Obtain service for the machine
S (3): Maintain proper oil levels
S (4): Locate prints
S (5): Locate WIP forms
S (6): -
S (7): -
S (8): -
S (9): -




-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain LOCATE PRINTS
Press @-F to change Find.

Record 5 of 159
===============================================================================
Task: TASK: SET UP SEIKI AUTOMATIC TURRET MACHINE(S)
Task Code: -
S (1): Locate prints
S (2): Locate tape
S (3): Identify problems with the machine
S (4): Obtain service for the machine
S (5): -
S (6): -
S (7): -
S (8): -
S (9): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK SYS                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain LUBE AND OIL MACHINE
Press @-F to change Find.

Record 115 of 159
==============================================================================
Task: TASK: OPERATE MILWAUKEE MATIC EB
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): Locate gaging
S (6): Monitor oil levels
S (7): Lube and oil machine
S (8): -
S (9): -




------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: TASK SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain LUBE AND OIL MACHINE
Press @-F to change Find.

Record 114 of 159
===============================================================================
Task: TASK: SET UP MILWAUKEE EB
Task Code: -
S (1): Identify problems with machines
S (2): Obtain service for machines
S (3): How to obtain WIP, tooling, and blueprints
S (4): Check hydraulic oil
S (5): Locate gaging
S (6): Monitor oil levels
S (7): Lube and oil machine
S (8): -
S (9): -

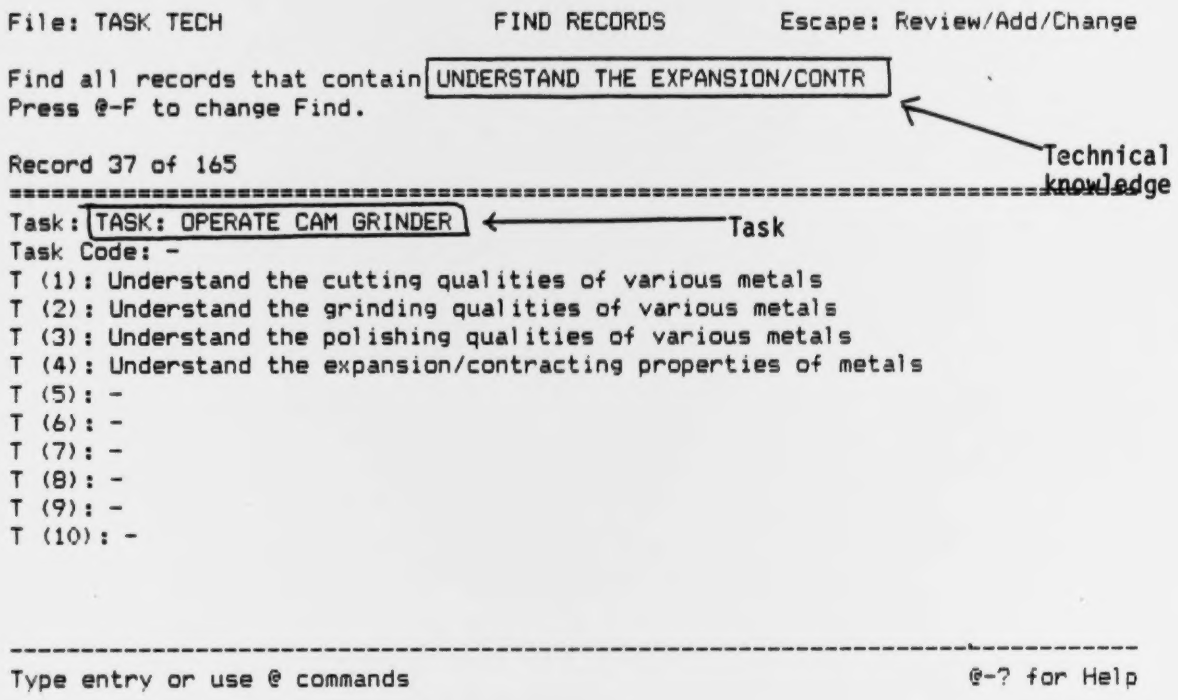


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

APPENDIX E

TECHNICAL KNOWLEDGE: TASKS

What tasks require this technical knowledge?

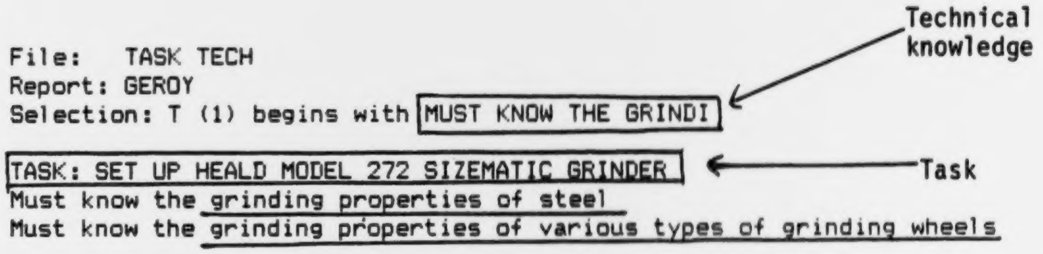


```
File: TASK TECH                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE EXPANSION/CONTR
Press @-F to change Find.

Record 37 of 165
================================================================================
Task: TASK: OPERATE CAM GRINDER
Task Code: -
T (1): Understand the cutting qualities of various metals
T (2): Understand the grinding qualities of various metals
T (3): Understand the polishing qualities of various metals
T (4): Understand the expansion/contracting properties of metals
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -

--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```



```
File:   TASK TECH
Report: GEROY
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: SET UP HEALD MODEL 272 SIZEMATIC GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels
```

File: TASK TECH
Report: GEROY
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: SET UP LANDIS EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP NORTON EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE NORTON EXTERNAL GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP GARDNER DISK GRINDER HORIZONTAL
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: OPERATE GARDNER DISK GRINDER HORIZONTAL
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI THRU FEED GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE CINCINNATI THRU FEED GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP LANDIS PLUNGE DRIVE GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE LANDIS PLUNGE DRIVE GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: SET UP HEALD MODEL 271 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 271 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP HEALD MODEL 272 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE HEALD MODEL 272 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP CINCINNATI MODEL 181 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY
Selection: T (1) begins with MUST KNOW THE GRINDI

TASK: OPERATE CINCINNATI MODEL 181 GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP EXTERNAL STEPMASTER GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE EXTERNAL STEPMASTER GRINDER
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: SET UP ROTARY VERTICAL SPINDLE
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

TASK: OPERATE ROTARY VERTICAL SPINDLE
Must know the grinding properties of steel
Must know the grinding properties of various types of grinding wheels

File: TASK TECH
Report: GEROY
Selection: T (1) begins with UNDERSTAND THE CUTTI

TASK: OPERATE SURFACE GRINDER
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE BENCH GRINDERS
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE CONTOUR SAW
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE VERTICAL SHAPER
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

TASK: OPERATE CAM GRINDER
Understand the cutting qualities of various metals
Understand the grinding qualities of various metals
Understand the polishing qualities of various metals
Understand the expansion/contracting properties of metals

```
File: TASK TECH                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING
Press @-F to change Find.

Record 15 of 165
===============================================================================
Task: TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER
Task Code: -
T (1): Understand the expansion/contracting properties of metals
T (2): Understand the cutting qualities of various metals
T (3): Understand the grinding qualities of steel and carbide
T (4): Understand the polishing qualities of steel and carbide
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK TECH                   FIND RECORDS        Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING
Press @-F to change Find.

Record 17 of 165
===============================================================================
Task: TASK: OPERATE HEALD TOOL GRINDING MACHINE
Task Code: -
T (1): Understand the expansion/contracting properties of metals
T (2): Understand the cutting qualities of various metals
T (3): Understand the grinding qualities of steel and carbide
T (4): Understand the polishing qualities of steel and carbide
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK TECH                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE POLISHING
Press @-F to change Find.

Record 20 of 165
===============================================================================
Task: TASK: OPERATE SURFACE GRINDER
Task Code: -
T (1): Understand the expansion/contracting properties of metals
T (2): Understand the cutting qualities of various metals
T (3): Understand the grinding qualities of steel and carbide
T (4): Understand the polishing qualities of steel and carbide
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: TASK TECH                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE EXPANSION/CONTR
Press @-F to change Find.

Record 15 of 165
================================================================================
Task: TASK: OPERATE CINCINNATI MONOSET TOOL GRINDER
Task Code: -
T (1): Understand the expansion/contracting properties of metals
T (2): Understand the cutting qualities of various metals
T (3): Understand the grinding qualities of steel and carbide
T (4): Understand the polishing qualities of steel and carbide
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK TECH                   FIND RECORDS       Escape: Review/Add/Change

Find all records that contain UNDERSTAND THE EXPANSION/CONTR
Press @-F to change Find.

Record 37 of 165
==============================================================================
Task: TASK: OPERATE CAM GRINDER
Task Code: -
T (1): Understand the cutting qualities of various metals
T (2): Understand the grinding qualities of various metals
T (3): Understand the polishing qualities of various metals
T (4): Understand the expansion/contracting properties of metals
T (5): -
T (6): -
T (7): -
T (8): -
T (9): -
T (10): -


------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.TECH                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain PRINCIPLES OF CNC
Press @-F to change Find.

Record 18 of 40
================================================================================
Machine: ACROLOC 4 AXIS VMC W/CNC
T: Principles of CNC Programming
T: -
T: -
T: -
T: -
T: -





--------------------------------------------------------------------------------
Type entry or use @ commands                                         @-? for Help
```

```
File: MACH.TECH                   FIND RECORDS       Escape: Review/Add/Change

Find all records that contain PRINCIPLES OF CNC
Press @-F to change Find.

Record 19 of 40
================================================================================
Machine: OKATA VM 4 AXIS W/ CNC
T: Principles of CNC Programming
T: -
T: -
T: -
T: -
T: -





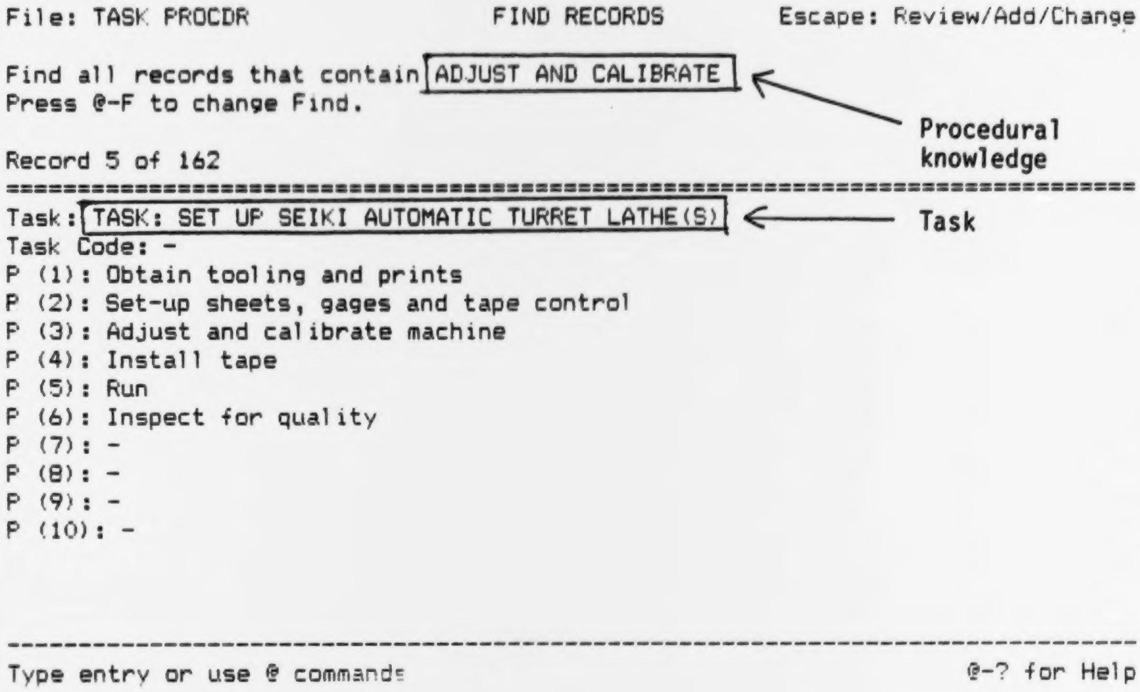



--------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

APPENDIX F

PROCEDURAL KNOWLEDGE: TASKS

What tasks require this procedural knowledge?



```
File: TASK PROCDR                    FIND RECORDS         Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE
Press @-F to change Find.

Record 5 of 162
================================================================================
Task: TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)
Task Code: -
P (1): Obtain tooling and prints
P (2): Set-up sheets, gages and tape control
P (3): Adjust and calibrate machine
P (4): Install tape
P (5): Run
P (6): Inspect for quality
P (7): -
P (8): -
P (9): -
P (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                         @-? for Help
```

```
File: TASK PROCDR                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE
Press @-F to change Find.

Record 17 of 162
===============================================================================
Task: TASK: OPERATE CINCINNATI MONOSETT TOOL GRINDER
Task Code: -
P (1): Obtain prints
P (2): Obtain tooling
P (3): Obtain gaging
P (4): Attach work
P (5): Attach tooling
P (6): Adjust and calibrate machine
P (7): Run
P (8): Inspect
P (9): -
P (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE
Press @-F to change Find.

Record 29 of 162
===============================================================================
Task: TASK: OPERATE SUNNEN PRECISION HONING MACHINE
Task Code: -
P (1): Obtain prints
P (2): Obtain tooling
P (3): Obtain gaging
P (4): Attach work
P (5): Attach tooling
P (6): Adjust and calibrate machine
P (7): Run
P (8): Inspect
P (9): -
P (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain ADJUST AND CALIBRATE
Press @-F to change Find.

Record 22 of 162
===============================================================================
Task: TASK: OPERATE SURFACE GRINDER
Task Code: -
P (1): Obtain prints
P (2): Obtain tooling
P (3): Obtain gaging
P (4): Attach work
P (5): Attach tooling
P (6): Adjust and calibrate machine
P (7): Run
P (8): Inspect
P (9): -
P (10): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                FIND RECORDS        Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS.
Press @-F to change Find.

Record 41 of 162
===============================================================================
Task:  TASK: SET UP GARDNER DISK GRINDER
Task Code: -
P (1): Obtain WIP form and blueprints
P (2): Attach tools
P (3): Attach fixture
P (4): Load stock
P (5): Set speeds
P (6): Run
P (7): Inspect for quality
P (8): Readjust if necessary
P (9): -
P (10): -

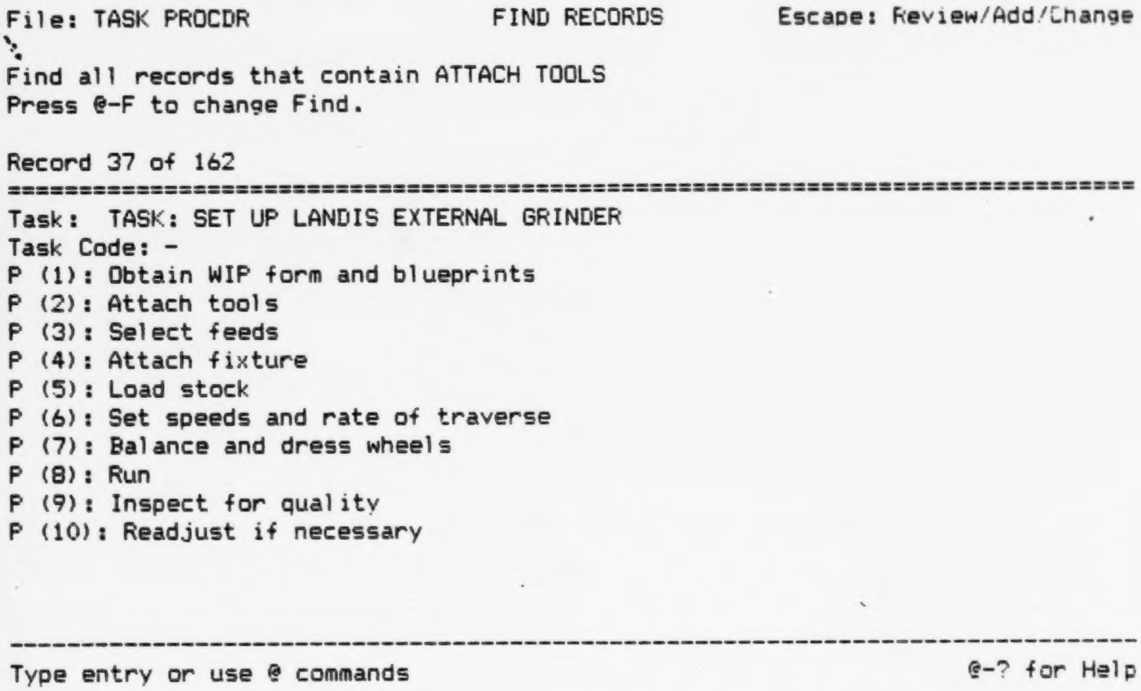

-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS
Press @-F to change Find.

Record 43 of 162
================================================================================
Task:  TASK: SET UP CINCINNATI THRU FEED GRINDER
Task Code: -
P (1): Obtain WIP form
P (2): Obtain blueprints
P (3): Attach tools
P (4): Attach fixture
P (5): Load stock
P (6): Set speeds
P (7): Run
P (8): Inspect for quality
P (9): Readjust if necessary
P (10): -


--------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```



```
File: TASK PROCDR                FIND RECORDS        Escape: Review/Add/Change

Find all records that contain ATTACH TOOLS
Press @-F to change Find.

Record 37 of 162
==============================================================================
Task:  TASK: SET UP LANDIS EXTERNAL GRINDER
Task Code: -
P (1): Obtain WIP form and blueprints
P (2): Attach tools
P (3): Select feeds
P (4): Attach fixture
P (5): Load stock
P (6): Set speeds and rate of traverse
P (7): Balance and dress wheels
P (8): Run
P (9): Inspect for quality
P (10): Readjust if necessary


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                FIND RECORDS       Escape: Review/Add/Change

Find all records that contain LOAD TAPE
Press @-F to change Find.

Record 112 of 162
===============================================================================
Task:  TASK: SET UP MILWAUKEE MATIC EB
Task Code: -
P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging
P (2): Attach fixtures
P (3): Attach tools
P (4): Mount work
P (5): Adjust machine
P (6): Load tape
P (7): Run
P (8): Inspect for quality
P (9): Adjust, if necessary
P (10): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: TASK PROCDR                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain LOAD TAPE
Press @-F to change Find.

Record 119 of 162
================================================================================
Task:  TASK: SET UP SEIKI LATHE(S)
Task Code: -
P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging
P (2): Attach fixtures
P (3): Attach tools
P (4): Mount work
P (5): Adjust machine
P (6): Load tape
P (7): Run
P (8): Inspect for quality
P (9): Adjust, if necessary
P (10): -



--------------------------------------------------------------------------------
Type entry or use @ commands                                          @-? for Help
```

```
File: TASK PROCDR                FIND RECORDS        Escape: Review/Add/Change

Find all records that contain LOAD TAPE
Press @-F to change Find.

Record 117 of 162
==============================================================================
Task:  TASK: SET UP DO ALL SAW
Task Code: -
P (1): Obtain WIP forms, Blueprints, Tooling, and Gaging
P (2): Attach fixtures
P (3): Attach tools
P (4): Mount work
P (5): Adjust machine
P (6): Load tape
P (7): Run
P (8): Inspect for quality
P (9): Adjust, if necessary
•P (10): -


------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: TASK PROCDR               FIND RECORDS        Escape: Review/Add/Change

Find all records that contain INSPECT
Press @-F to change Find.

Record 1 of 162
===============================================================================
Task: TASK: OPERATE SEIKI AUTOMATIC TURRET LATHE
Task Code: -
P (1): Run
P (2): Unload
P (3): Inspect
P (4): Readjust
P (5): -
P (6): -
P (7): -
P (8): -
P (9): -
P (10): -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: TASK PROCDR                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain INSPECT
Press @-F to change Find.

Record 5 of 162
================================================================================
Task: TASK: SET UP SEIKI AUTOMATIC TURRET LATHE(S)
Task Code: -
P (1): Obtain tooling and prints
P (2): Set-up sheets, gages and tape control
P (3): Adjust and calibrate machine
P (4): Install tape
P (5): Run
P (6): Inspect for quality
P (7): -
P (8): -
P (9): -
P (10): -



--------------------------------------------------------------------------------
Type entry or use @ commands                                         @-? for Help
```

```
File: TASK PROCDR                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain INSPECT
Press @-F to change Find.

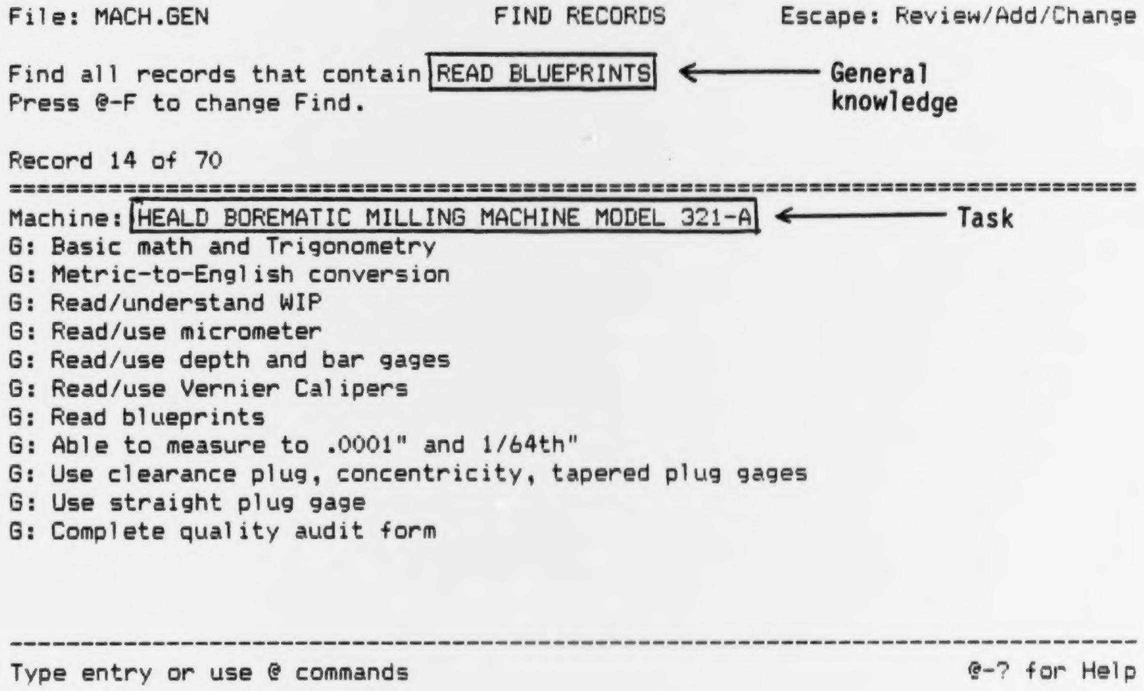
Record 7 of 162
===============================================================================
Task: TASK: SET UP STANDARD END PLATE FINISHING LATHE
Task Code: -
P (1): Obtain tooling and prints
P (2): Obtain setup sheets
P (3): Obtain gages
P (4): Adjust and calibrate
P (5): Run a job
P (6): Inspect for quality
P (7): -
P (8): -
P (9): -
P (10): -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

APPENDIX G

GENERAL KNOWLEDGE: MACHINES

Which machines require this general knowledge?



```
File: MACH.GEN                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ BLUEPRINTS
Press @-F to change Find.

Record 14 of 70
================================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
G: Basic math and Trigonometry
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use depth and bar gages
G: Read/use Vernier Calipers
G: Read blueprints
G: Able to measure to .0001" and 1/64th"
G: Use clearance plug, concentricity, tapered plug gages
G: Use straight plug gage
G: Complete quality audit form


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

General knowledge

Task

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ/UNDERSTAND WIP
Press @-F to change Find.

Record 11 of 70
===============================================================================
Machine: SEIKI CNC NEA LATHE
G: Basic math
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use depth scales
G: Read/use Vernier Calipers
G: Read/use gages
G: -
G: -
G: -
G: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find·all records that contain READ/UNDERSTAND WIP
Press @-F to change Find.

Record 14 of 70
================================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
G: Basic math and Trigonometry
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use depth and bar gages
G: Read/use Vernier Calipers
G: Read blueprints
G: Able to measure to .0001" and 1/64th"
G: Use clearance plug, concentricity, tapered plug gages
G: Use straight plug gage
G: Complete quality audit form



--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.GEN                   FIND RECORDS       Escape: Review/Add/Change

Find all records that contain READ/UNDERSTAND WIP
Press @-F to change Find.

Record 15 of 70
==============================================================================
Machine: DELTA 6 SPINDLE DRILL PRESS
G: Basic math
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use scales
G: Measure to .0001" and 1/64th"
G: -
G: -
G: -
G: -
G: -



------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: MACH.GEN                   FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"
Press @-F to change Find.

Record 15 of 70
==============================================================================
Machine: DELTA 6 SPINDLE DRILL PRESS
G: Basic math
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use scales
G: Measure to .0001" and 1/64th"
G: -
G: -
G: -
G: -
G: -


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"
Press @-F to change Find.

Record 19 of 70
==============================================================================
Machine: OKATA CNC MILLING MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: Triangulation (trigonometry)
G: Read/use radius gages
G: -
G: -


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MEASURE TO .0001"
Press @-F to change Find.

Record 33 of 70
==============================================================================
Machine: BRIDGEPORT 4 AXIS VMC W/ CNC
G: Basic math
G: Metric-to-English conversion
G: Read/use gages
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: -
G: -
G: -
G: -


------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER
Press @-F to change Find.

Record 10 of 70
================================================================================
Machine: SEIKI CNC NE LATHE
G: Basic math
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use depth scales
G: Read/use Vernier Calipers
G: Read/use gages
G: -
G: -
G: -
G: -



--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.GEN                 FIND RECORDS       Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER
Press @-F to change Find.

Record 34 of 70
===============================================================================
Machine: ACROLOC 4 AXIS VMC W/ CNC
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: -
G: -
G: -
G: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.GEN                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain READ/USE VERNIER
Press @-F to change Find.

Record 14 of 70
==============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
G: Basic math and Trigonometry
G: Metric-to-English conversion
G: Read/understand WIP
G: Read/use micrometer
G: Read/use depth and bar gages
G: Read/use Vernier Calipers
G: Read blueprints
G: Able to measure to .0001" and 1/64th"
G: Use clearance plug, concentricity, tapered plug gages
G: Use straight plug gage
G: Complete quality audit form


------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.GEN                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER
Press @-F to change Find.

Record 2 of 70
==============================================================================
Machine: TRANSFER LINE
G: Basic math
G: Metric-to-English conversion
G: Read/use micrometer & gages
G: Read blueprints
G: Read & understand WIP forms
G: Read & understand panel gages
G: Read & understand Hex Center gages
G: Read & understand plug gages
G: Read & understand Vernier calipers
G: -
G: -


------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: MACH.GEN                     FIND RECORDS         Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER
Press @-F to change Find.

Record 3 of 70
==============================================================================
Machine: JONES & LAMSON
G: Basic math
G: Metric-to-English conversion
G: Read/use micrometer & gages
G: Read blueprints
G: Read & understand WIP forms
G: Read & understand panel gages
G: Read & understand Hex Center gages
G: Read & understand plug gages
G: Read & understand Vernier calipers
G: -
G: -



------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ & UNDERSTAND HEX CENTER
Press @-F to change Find.

Record 4 of 70
===============================================================================
Machine: MSO MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use micrometer & gages
G: Read blueprints
G: Read & understand WIP forms
G: Read & understand panel gages
G: Read & understand Hex Center gages
G: Read & understand plug gages
G: Read & understand Vernier calipers
G: -
G: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain TRIANGULATION
Press @-F to change Find.

Record 19 of 70
================================================================================
Machine: OKATA CNC MILLING MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use location gages, Vernier calipers.
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: Triangulation (trigonometry)
G: Read/use radius gages
G: -
G: -



--------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

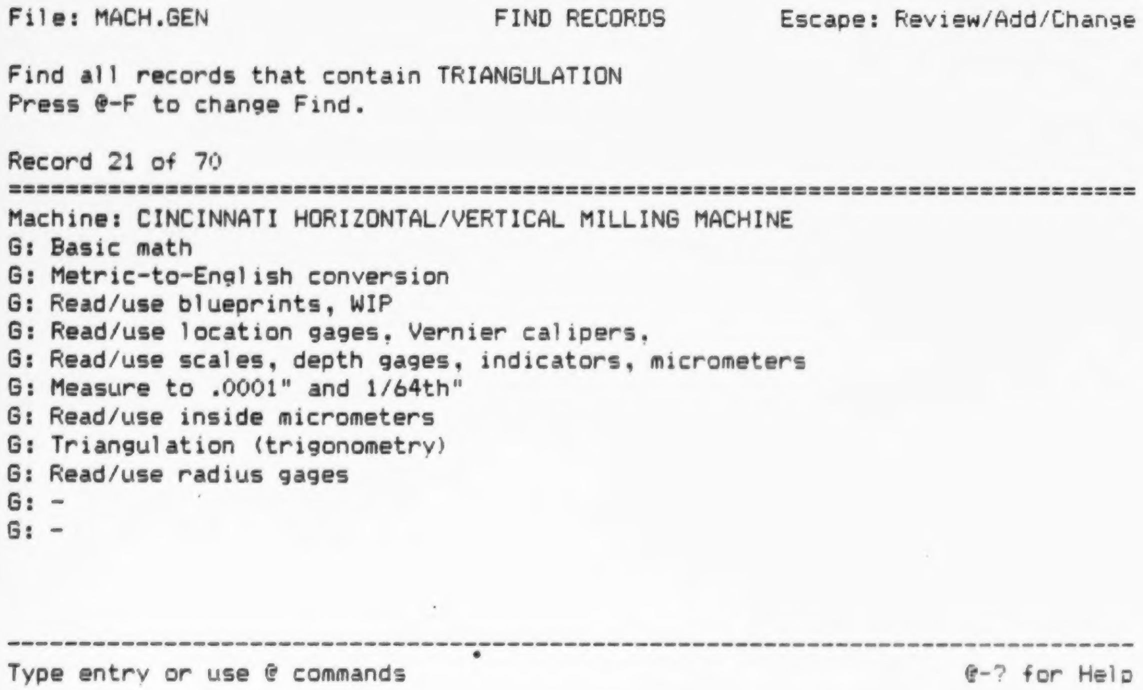
```
File: MACH.GEN                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain TRIANGULATION
Press @-F to change Find.

Record 20 of 70
===============================================================================
Machine: BRIDGEPORT CNC MILLING MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: Triangulation (trigonometry)
G: Read/use radius gages
G: -
G: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```



```
File: MACH.GEN                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain TRIANGULATION
Press @-F to change Find.

Record 21 of 70
===============================================================================
Machine: CINCINNATI HORIZONTAL/VERTICAL MILLING MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: Triangulation (trigonometry)
G: Read/use radius gages
G: -
G: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS
Press @-F to change Find.

Record 19 of 70
===============================================================================
Machine: OKATA CNC MILLING MACHINE
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: Triangulation (trigonometry)
G: Read/use radius gages
G: -
G: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.GEN                      FIND RECORDS        Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS
Press @-F to change Find.

Record 33 of 70
===============================================================================
Machine: BRIDGEPORT 4 AXIS VMC W/ CNC
G: Basic math
G: Metric-to-English conversion
G: Read/use gages
G: Read/use location gages, Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: -
G: -
G: -
G: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                         @-? for Help
```

```
File: MACH.GEN                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain READ/USE INSIDE MICROMETERS
Press @-F to change Find.

Record 34 of 70
==============================================================================
Machine: ACROLOC 4 AXIS VMC W/ CNC
G: Basic math
G: Metric-to-English conversion
G: Read/use blueprints, WIP
G: Read/use Vernier calipers,
G: Read/use scales, depth gages, indicators, micrometers
G: Measure to .0001" and 1/64th"
G: Read/use inside micrometers
G: -
G: -
G: -
G: -

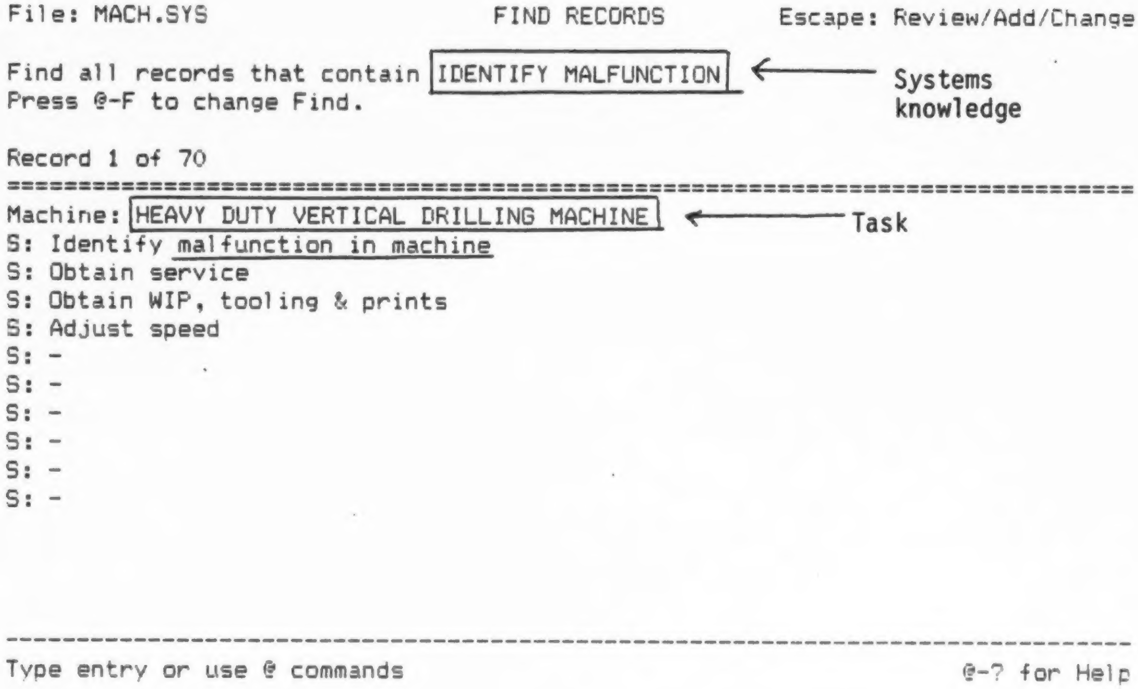


------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

APPENDIX H

SYSTEMS KNOWLEDGE: MACHINES

Which machines require this systems knowledge?



```
File: MACH.SYS                  FIND RECORDS          Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION
Press @-F to change Find.

Record 1 of 70
===============================================================================
Machine: HEAVY DUTY VERTICAL DRILLING MACHINE
S: Identify malfunction in machine
S: Obtain service
S: Obtain WIP, tooling & prints
S: Adjust speed
S: -
S: -
S: -
S: -
S: -
S: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

Systems knowledge

Task

```
File: MACH.SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION
Press @-F to change Find.

Record 2 of 70
===============================================================================
Machine: TRANSFER LINE
S: Locate prints, tooling, and WIP
S: Identify malfunction on machine
S: Obtain service for machine
S: -
S: -
S: -
S: -
S: -
S: -
S: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.SYS                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION
Press @-F to change Find.

Record 7 of 70
==============================================================================
Machine: HEALD STANDARD BOREMATIC MILLING MACHINE
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -



------------------------------------------------------------------------------
Type entry or use @ commands                                     @-? for Help
```

```
File: MACH.SYS                    FIND RECORDS       Escape: Review/Add/Change

Find all records that contain IDENTIFY MALFUNCTION
Press @-F to change Find.

Record 13 of 70
==============================================================================
Machine: POTTER & JOHNSON CHUCKING LATHE
S: Locate prints and tape
S: Identify malfunction on machine
S: Obtain service for machine
S: -
S: -
S: -
S: -
S: -
S: -
S: -



------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE
Press @-F to change Find.

Record 7 of. 70
===============================================================================
Machine: HEALD STANDARD BOREMATIC MILLING MACHINE
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -




-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.SYS                 FIND RECORDS       Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE
Press @-F to change Find.

Record 9 of 70
===============================================================================
Machine: HORIZONTAL TURRET LATHE
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: -
S: -
S: -
S: -
S: -
S: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MONITOR AIR PRESSURE
Press @-F to change Find.

Record 14 of 70
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.SYS                    FIND RECORDS     Escape: Restore former entry

Find all records that contain MONITOR HYDRAULIC OIL
Press @-F to change Find.

Record 7 of 70
==============================================================================
Machine: HEALD STANDARD BOREMATIC MILLING MACHINE
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -



------------------------------------------------------------------------------
Type entry or use @ commands                                        47K Avail.
```

```
File: MACH.SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MONITOR HYDRAULIC OIL
Press @-F to change Find.

Record 8 of 70
===============================================================================
Machine: HEALD BOREMATIC PIN MACHINE
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.SYS                    FIND RECORDS        Escape: Review/Add/Change

Find all records that contain MONITOR HYDRAULIC OIL
Press @-F to change Find.

Record 14 of 70
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
S: Check hydraulic oil level
S: Identify malfunction on machine
S: Obtain service for machine
S: Monitor air pressure
S: Monitor hydraulic oil
S: -
S: -
S: -
S: -
S: -

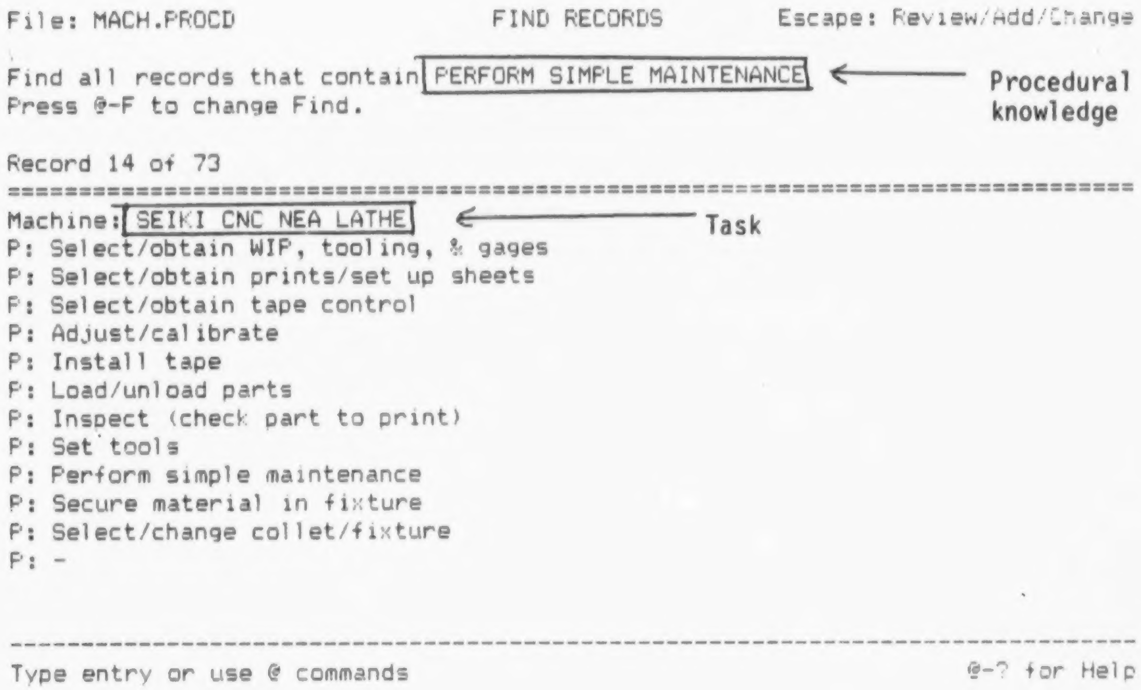


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

APPENDIX I

PROCEDURAL KNOWLEDGE: MACHINES

Which machines require this procedural knowledge?



```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE
Press @-F to change Find.

Record 14 of 73
===============================================================================
Machine: SEIKI CNC NEA LATHE
P: Select/obtain WIP, tooling, & gages
P: Select/obtain prints/set up sheets
P: Select/obtain tape control
P: Adjust/calibrate
P: Install tape
P: Load/unload parts
P: Inspect (check part to print)
P: Set tools
P: Perform simple maintenance
P: Secure material in fixture
P: Select/change collet/fixture
P: -

-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

Procedural knowledge

Task

```
File: MACH.PROCD                FIND RECORDS       Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE
Press @-F to change Find.

Record 10 of 73
=====================================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools


-------------------------------------------------------------------------------------
Type entry or use @ commands                                          @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE
Press @-F to change Find.

Record 11 of 73
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools


-------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain PERFORM SIMPLE MAINTENANCE
Press @-F to change Find.

Record 13 of 73
==============================================================================
Machine: SEIKI CNC NE LATHE
P: Select/obtain WIP, tooling, & gages
P: Select/obtain prints/set up sheets
P: Select/obtain tape control
P: Adjust/calibrate
P: Install tape
P: Load/unload parts
P: Inspect (check part to print)
P: Set tools
P: Perform simple maintenance
P: Secure material in fixture
P: Select/change collet/fixture
P: -


------------------------------------------------------------------------------
.Type entry or use @ commands                                     @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET WATER PRESSURES
Press @-F to change Find.

Record 62 of 73.
===============================================================================
Machine: SWECO
P: Load/unload parts
P: Run
P: Set time levels
P: Inspect
P: Set weights
P: Adjust compounds
P: Set water pressures
P: Set compound flows
P: Obtain WIP
P: -
P: -
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET WATER PRESSURES
Press @-F to change Find.

Record 63 of 73
================================================================================
Machine: BARREL WASH TUMBLE
P: Load/unload parts
P: Run
P: Set time levels
P: Inspect
P: Adjust compounds
P: Set water pressures
P: Rust protect
P: Add water
P: Obtain WIP
P: -
P: -
P: -

--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain SET WATER PRESSURES
Press @-F to change Find.

Record 67 of 73
===============================================================================
Machine: POWDER COATING ROOM
P: Load/unload parts
P: Inspect
P: Set water pressures
P: Obtain WIP
P: Adjust heat
P: -
P: -
P: -
P: -
P: -
P: -
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS         Escape: Review/Add/Change

Find all records that contain SET SPEEDS
Press @-F to change Find.

Record 4 of 73
===============================================================================
Machine: NATCO MULTI-SPINDLE DRILL PRESS
P: Locate & obtain fixture, prints, WIP, gages, & tooling
P: Set up press
P: Run
P: Inspect
P: Adjust
P: Load/unload
P: Obtain drills
P: Obtain reamers
P: Set speeds
P: Fix tools
P: -
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET SPEEDS
Press @-F to change Find.

Record 19 of 73
==============================================================================
Machine: DELTOFF 12, 18, 36 GUN DRILLS
P: Locate/obtain WIP, blueprints
P: Locate/obtain fixture
P: Inspect
P: Select/set speeds
P: Select/set feeds
P: Change/reset drills
P: Change bushings
P: -
P: -
P: -
P: -
P: -


------------------------------------------------------------------------------
Type entrv or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET SPEEDS
Press @-F to change Find.

Record 17 of 73
==============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
P: Select/obtain WIP, tooling, & gages
P: Select/change collet/fixture
P: Select/change index plate
P: Select/change drills
P: Select/set feeds
P: Select/set speeds
P: Set stops/offsets
P: Load/unload parts
P: Perform simple maintenance
P: Grind/sharpen tools
P: -
P: -

------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS         Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS
Press @-F to change Find.

Record 5 of 73
================================================================================
Machine: TRANSFER LINE
P: Select & Obtain WIP & tools
P: Select & obtain WIP set up sheets
P: Preset drills
P: Adjust heads
P: Preset mill ends
P: Change Jaws and Jobs
P: Adjust brackets
P: Sharpen tools
P: Inspect (check part to print)
P: Adjust machine
P: Load/unload and run
P: Set tools


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
File: MACH.PROCD                  FIND RECORDS         Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS
Press @-F to change Find.

Record 10 of 73
================================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS
Press @-F to change Find.

Record 5 of 73
===============================================================================
Machine: TRANSFER LINE
P: Select & Obtain WIP & tools
P: Select & obtain WIP set up sheets
P: Preset drills
P: Adjust heads
P: Preset mill ends
P: Change Jaws and Jobs
P: Adjust brackets
P: Sharpen tools
P: Inspect (check part to print)
P: Adjust machine
P: Load/unload and run
P: Set tools


-------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS
Press @-F to change Find.

Record 10 of 73
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 222
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SHARPEN TOOLS
Press @-F to change Find.

Record 11 of 73
==============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools


------------------------------------------------------------------------------
Type entry or use @ commands                                      @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS       Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS
Press @-F to change Find.

Record 32 of 73
================================================================================
Machine: CINCINNATI 5 HORIZONTAL MILLING MACHINE
P: Secure materials
P: Run (operate)
P: Inspect (check part to print)
P: Select/obtain WIP, tools, blueprints, tape
P: Set stops
P: Adjust
P: Attach fixture/collet
P: Select feeds/ speeds
P: -
P: -
P: -
P: -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.PROCD                 FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS
Press @-F to change Find.

Record 33 of 73
================================================================================
Machine: CINCINNATI 2 HORIZONTAL MILLING MACHINE
P: Secure materials
P: Run (operate)
P: Inspect (check part to print)
P: Select/obtain WIP, tools, blueprints, tape
P: Set stops
P: Adjust
P: Attach fixture/collet
P: Select feeds/ speeds
P: -
P: -
P: -
P: -


--------------------------------------------------------------------------------
Type entry or use @ commands                                        @-? for Help
```

```
File: MACH.PROCD                FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SECURE MATERIALS
Press @-F to change Find.

Record 40 of 73
===============================================================================
Machine: CINCINNATI MONOSETT TOOL GRINDER
P: Select/obtain WIP
P: Secure materials
P: Select/obtain prints
P: Check part to print
P: Select/obtain mount wheels
P: Select speed/feeds
P: Dress wheel
P: Center and true stock
P: Load/unload
P: Set/adjust stops
P: Adjust machine
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS       Escape: Review/Add/Change

Find all records that contain SET FEEDS
Press @-F to change Find.

Record 11 of 73
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 324-A
P: Select/obtain WIP, tooling, gages, collet fixtures
P: Select/change index plate, drills, boring bars, reamers
P: Select/set feeds and speeds
P: Set stops/offsets
P: Adjust milling heads
P: Load/unload parts
P: Inspect (check part to print)
P: Adjust machine-- set switches
P: Perform simple maintenance
P: Select/change tool
P: Secure material in furnace
P: Grind/sharpen tools



-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD                  FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET FEEDS
Press @-F to change Find.

Record 17 of 73
===============================================================================
Machine: HEALD BOREMATIC MILLING MACHINE MODEL 321-A
P: Select/obtain WIP, tooling, & gages
P: Select/change collet/fixture
P: Select/change index plate
P: Select/change drills
P: Select/set feeds
P: Select/set speeds
P: Set stops/offsets
P: Load/unload parts
P: Perform simple maintenance
P: Grind/sharpen tools
P: -
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

```
File: MACH.PROCD              FIND RECORDS        Escape: Review/Add/Change

Find all records that contain SET FEEDS
Press @-F to change Find.

Record 19 of 73
===============================================================================
Machine: DELTOFF 12, 18, 36 GUN DRILLS
P: Locate/obtain WIP, blueprints
P: Locate/obtain fixture
P: Inspect
P: Select/set speeds
P: Select/set feeds
P: Change/reset drills
P: Change bushings
P: -
P: -
P: -
P: -
P: -


-------------------------------------------------------------------------------
Type entry or use @ commands                                       @-? for Help
```

Project Number Three

Maintenance, Manufacturing Cell, and Industrial Engineering/Product Engineering Training Needs Assessment Project

August 1987

Volume 5

Worker Self Assessment

Part I - Frequency & Competencies Data

Part II - Self Assessment Instruments

The Pennsylvania State University

Division of Counseling and Educational Psychology
and Career Studies

File: MASTER C

ROSTER A MACHINING — SECTIONS 1&2

QUESTION # PT 1	QUESTION # PT 2	task	GEN'L KNLGE	1 NEVER f	%	2 1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/ HELP f	%	3 SIMILAR f	%	4 NEED TRNG f	%
146	150	read micrometers	x	6	5%	2	2%	1	1%	114	86%	8	6%	118	89%	6	5%	5	4%	2	2%
152	156	use basic math	x	9	7%	5	4%	1	1%	105	81%	7	5%	116	87%	11	8%	3	2%	0	0%
145	149	read blueprints	x	6	5%	3	2%	1	1%	104	78%	4	3%	110	83%	14	11%	3	2%	2	2%
185	190	arrange for service		49	37%	8	6%	1	1%	61	46%	11	8%	77	58%	21	16%	15	11%	13	10%
180	184	load/unload machine		11	8%	0	0%	0	0%	111	83%	8	6%	115	86%	5	4%	6	5%	3	2%
190	195	assist in troubleshoo		20	15%	3	2%	3	2%	87	65%	10	8%	96	72%	17	13%	7	5%	8	6%
186	191	check part to print		10	8%	9	7%	1	1%	112	84%	1	1%	115	86%	7	5%	5	4%	4	3%
155	159	use Vernier calipers	x	9	7%	6	5%	4	3%	101	76%	9	7%	114	86%	8	6%	5	4%	4	3%
169	173	use depth gages	x	31	23%	4	3%	4	3%	66	50%	19	14%	91	68%	12	9%	13	10%	12	9%
166	170	read WIP forms		31	23%	5	4%	1	1%	85	64%	9	7%	8	6%	17	13%	12	9%	15	11%
181	186	obtain tooling		15	11%	6	5%	3	2%	100	75%	8	6%	109	82%	12	9%	5	4%	3	2%
188	193	mount material		15	11%	10	8%	2	2%	97	73%	12	9%	102	77%	12	9%	9	7%	6	5%
189	194	change fixture		22	17%	28	21%	4	3%	81	61%	18	14%	98	74%	10	8%	11	8%	9	7%
158	162	use trigonometry	x	108	81%	10	8%	0	0%	6	5%	6	5%	16	12%	14	11%	20	15%	81	61%
178	182	read Machinist handbk	x	43	32%	28	21%	7	5%	26	20%	27	20%	95	71%	16	12%	6	5%	11	8%
156	160	use Johannson blocks	x	28	21%	10	8%	3	2%	82	62%	6	5%	101	76%	13	10%	6	5%	10	8%
157	161	use Machinist handbk	x	50	38%	25	19%	4	3%	40	30%	12	9%	92	69%	18	14%	8	6%	11	8%
159	163	read complicated draw	x	32	24%	16	12%	4	3%	69	52%	11	8%	76	57%	31	23%	7	5%	19	14%
160	164	use depth gage	x	10	8%	11	8%	2	2%	96	72%	11	8%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5	4%
161	165	use shadow gage	x	42	32%	20	15%	1	1%	45	34%	21	16%	87	65%	19	14%	14	11%	9	7%
162	166	use radius gage	x	20	15%	14	11%	3	2%	81	61%	13	10%	105	79%	12	9%	8	6%	6	5%
149	153	measure to .0001"	x	12	9%	9	7%	3	2%	97	73%	9	7%	115	86%	8	6%	6	5%	2	2%
183	188	assist w/ maintenance	x	25	19%	10	8%	1	1%	86	65%	10	8%	99	74%	16	12%	7	5%	6	5.
150	154	measure to 1/64"	x	7	5%	2	2%	3	2%	107	80%	9	7%	117	88%	5	4%	7	5%	2	2%
179	183	adjust machine		13	10%	2	2%	0	0%	110	83%	6	5%	113	85%	8	6%	4	3%	4	3%
182	187	clean,oil,lubricate		11	8%	1	1%	3	2%	111	83%	5	4%	115	86%	8	6%	4	3%	2	2%
78	82	oper.milling machines		65	49%	4	3%	4	3%	17	13%	39	29%	32	24%	35	26%	39	29%	25	19%
111	115	oper.Bridgeport CNCm:		104	78%	3	2%	0	0%	4	3%	19	14%	12	9%	17	13%	54	41%	48	36%
112	116	oper.Cincinnati horiz		86	65%	2	2%	2	2%	8	6%	32	24%	27	20%	17	13%	47	35%	40	30%
113	117	oper.Cincinnati verti		93	70%	3	2%	3	2%	5	4%	26	20%	27	20%	16	12%	49	37%	39	29%
70	74	oper.surface grinder		97	73%	6	5%	2	2%	7	5%	19	14%	17	13%	18	14%	52	39%	44	33%
12	16	setup drill press		53	40%	5	4%	4	3%	14	11%	55	41%	43	32%	39	29%	32	24%	17	13%
17	21	setup Cin thru feed		116	87%	4	3%	1	1%	5	4%	6	5%	9	7%	10	8%	54	41.	58	44%
60	64	oper.drill press		44	33%	12	9%	1	1%	13	10%	62	47%	45	34%	40	30%	29	22%	16	12%
147	151	read concentricity ga	x	13	10%	6	5%	1	1%	103	77%	6	5%	110	83%	9	7%	8	6%	4	3%
184	189	load tape in NC		87	65%	6	5%	2	2%	22	17%	13	10%	35	26%	24	18%	30	23%	38	29%
187	192	program machine		78	59%	7	5%	0	0%	35	26%	8	6%	48	36%	16	12%	28	21%	36	27%
79	83	oper.lathe		63	47%	7	5%	2	2%	12	9%	47	35%	35	26%	27	20%	39	29%	30	23%
13	17	setup Bridgeport mill		75	56%	6	5%	3	2%	11	8%	36	27%	33	25%	30	23%	39	29%	27	20%
51	55	setup MSD		114	86%	2	2%	3	2%	1	1%	11	8%	14	11%	10	8%	49	37%	58	44%
61	65	oper. Bridgeport mill		62	47%	10	8%	4	3%	9	7%	46	35%	39	29%	28	21%	34	26%	27	20%
66	70	oper.Cinnati Monosett		112	84%	1	1%	1	1%	0	0%	7	5%	1	1%	15	11%	55	41%	56	42%
67	71	oper.Heald tool grind		119	89%	1	1%	2	2%	2	2%	7	5%	6	5%	11	8%	52	39%	62	47%
68	72	oper. Norton surface		105	79%	5	4%	2	2%	6	5%	12	9%	13	10%	20	15%	49	37%	49	37%
69	73	oper.drill grinder		107	80%	4	3%	1	1%	3	2%	16	12%	10	8%	26	20%	48	36%	47	35%
72	76	oper.cutter & tool		119	89%	2	2%	0	0%	1	1%	10	8%	5	4%	19	14%	51	38%	56	42%
73	77	oper.tap grind		123	92%	0	0%	0	0%	0	0%	6	5%	4	3%	15	11%	47	35%	65	49%

ROSTER A
MACHINING

SECTIONS 1&2

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	1 NEVER f	%	2 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TRNG f	%
74	78	oper.thread chaser		104	78%	3	2%	2	2%	6	5%	15	11%	14	11%	19	14%	42	32%	56	42%
75	79	oper.Gleason cutter		124	93%	0	0%	2	2%	3	2%	2	2%	8	6%	11	8%	53	40%	59	44%
129	133	oper. MSD machine		109	82%	2	2%	3	2%	4	3%	13	10%	17	13%	11	8%	54	41%	49	37%
148	152	read plug gages	x	8	6%	5	4%	2	2%	104	78%	10	8%	115	86%	7	5%	5	4%	3	2%
14	18	setup Sunnen		106	80%	6	5%	3	2%	5	4%	10	8%	16	12%	21	16%	46	35%	47	35%
28	32	setup Potter&Johnson		100	75%	1	1%	1	1%	7	5%	22	17%	12	9%	15	11%	53	40%	49	37%
44	48	setup Scimmx		121	91%	1	1%	1	1%	4	3%	4	3%	5	4%	7	5%	48	36%	70	53%
65	69	oper.Sunnen horiz		104	78%	8	6%	2	2%	3	2%	13	10%	14	11%	23	17%	42	32%	51	38%
76	80	oper.single point car		120	90%	1	1%	0	0%	1	1%	9	7%	3	2%	16	12%	54	41%	53	44%
81	85	oper.surface grinder		92	69%	7	5%	2	2%	10	8%	21	16%	24	18%	25	19%	44	33%	36	27%
122	126	oper. Scimmx		118	89%	2	2%	0	0%	5	4%	4	3%	9	7%	10	8%	49	37%	62	47%
174	178	use slip gages	x	76	57%	9	7%	2	2%	26	20%	16	12%	38	29%	29	22%	33	25%	27	20%
11	15	setup Standard endpla		105	79%	3	2%	1	1%	4	3%	18	14%	8	6%	20	15%	54	41%	49	37%
25	29	setup Standard Heald		114	86%	3	2%	1	1%	4	3%	9	7%	8	6%	11	8%	45	34%	63	47%
26	30	setup Horizontal turr		89	67%	5	4%	1	1%	4	3%	32	24%	19	14%	18	14%	47	35%	43	32%
29	33	setup Warner SwazyAC		94	71%	5	4%	1	1%	6	5%	20	15%	19	14%	14	11%	48	36%	49	37%
45	49	setup DoAll saw		95	71%	7	5%	3	2%	8	6%	18	14%	20	15%	25	19%	44	33%	42	32%
46	50	setup Wagner saw		111	83%	3	2%	3	2%	6	5%	10	8%	15	11%	23	17%	47	35%	46	35%
47	51	setup Barber-Coleman		118	89%	2	2%	1	1%	3	2%	8	6%	9	7%	12	9%	51	38%	59	44%
48	52	setup Anvill Mill		109	82%	1	1%	1	1%	3	2%	17	13%	6	5%	18	14%	52	39%	53	40%
49	53	setup vertical broach		109	82%	2	2%	2	2%	5	4%	14	11%	7	5%	26	20%	47	35%	51	38%
52	56	setup Burke twin mill		122	92%	0	0%	2	2%	4	3%	3	2%	8	6%	13	10%	53	40%	56	42%
54	58	setup multiple spindl		114	86%	0	0%	1	1%	9	7%	9	7%	12	9%	8	6%	53	40%	58	44%
55	59	setup automatic screw		108	81%	2	2%	0	0%	11	8%	11	8%	16	12%	11	8%	47	35%	57	43%
56	60	setup gear shaper		125	94%	2	2%	1	1%	1	1%	3	2%	5	4%	6	5%	56	42%	64	48%
77	81	oper.Sunnen precision		109	82%	6	5%	2	2%	5	4%	9	7%	13	10%	23	17%	42	32%	50	38%
98	102	oper.Heald borematic		109	82%	1	1%	1	1%	4	3%	15	11%	12	9%	10	8%	57	43%	50	38%
123	127	oper.DoAll Saw		92	69%	5	4%	3	2%	6	5%	24	18%	23	17%	28	21%	41	31%	39	29%
125	129	oper.Wagner saw		108	81%	5	4%	0	0%	6	5%	11	8%	16	12%	25	19%	46	35%	44	33%
130	130	oper. BarberColeman		110	83%	1	1%	2	2%	6	5%	11	8%	13	10%	11	8%	49	37%	57	43%
127	131	oper.Anvill Mill		93	70%	2	2%	3	2%	5	4%	26	20%	19	14%	19	14%	48	36%	44	33%
128	132	oper.vertical broache		99	74%	3	2%	2	2%	6	5%	21	16%	15	11%	18	14%	52	39%	46	35%
130	134	oper.Burke twin mill		110	83%	1	1%	2	2%	6	5%	11	8%	13	10%	10	8%	58	44%	48	36%
132	136	oper.multiple spindle		112	84%	1	1%	0	0%	6	5%	12	9%	13	10%	18	14%	50	38%	50	38%
133	137	oper.automatic screw		102	77%	0	0%	1	1%	9	7%	19	14%	19	14%	20	15%	52	39%	38	29%
134	138	oper.gear shaper		119	89%	0	0%	1	1%	5	4%	6	5%	6	5%	18	14%	60	45%	44	33%
168	172	use dial bar gages	x	46	35%	11	8%	6	5%	37	28%	31	23%	70	53%	24	18%	21	16%	16	12%
8	12	setup Seike 3NE		102	77%	8	6%	0	0%	8	6%	10	8%	12	9%	26	20%	48	36%	45	34%
9	13	setup Seike 4NE		104	78%	9	7%	0	0%	6	5%	10	8%	11	8%	24	18%	52	39%	44	33%
10	14	setup Seike 4NEA		111	83%	6	5%	0	0%	6	5%	6	5%	11	8%	20	15%	54	41%	46	35%
15	19	setup Landis external		107	80%	5	4%	3	2%	8	6%	8	6%	16	12%	11	8%	48	36%	56	42%
16	20	setup Gardner disk		118	89%	4	3%	0	0%	4	3%	5	4%	8	6%	11	8%	57	43%	55	41%
18	22	setup Landis plunge		115	86%	1	1%	2	2%	10	8%	3	2%	13	10%	8	6%	48	36%	62	47%
19	23	setup Heald 271		113	85%	3	2%	4	3%	8	6%	3	2%	13	10%	9	7%	47	35%	62	47%
20	24	setup Heald 272plain		111	83%	2	2%	7	5%	7	5%	4	3%	13	10%	9	7%	46	35%	62	47%
21	25	setup Heald 272sizema		114	86%	2	2%	3	2%	8	6%	4	3%	11	8%	10	8%	48	36%	61	46%
22	26	setup Cincinnati 181		118	89%	4	3%	2	2%	3	2%	4	3%	9	7%	9	7%	51	38%	62	47%

ROSTER A SECTIONS 1&2
MACHINING

QUESTION # PT 1	QUESTION # PT 2	task	1 GEN'L KNLGE NEVER f	%	2 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR NG f	%
23	27	setup external stepma	120	90%	3	2%	1	1%	3	2%	4	3%	7	5%	10	8%	50	38%	64	48%
24	28	setup standard Heald	110	83%	1	1%	1	1%	6	5%	12	9%	8	6%	15	11%	43	32%	61	46%
27	31	setup transfer machin	121	91%	1	1%	1	1%	1	1%	7	5%	5	4%	9	7%	52	39%	63	47%
30	34	setup 4-6 spindle	111	83%	2	2%	5	4%	2	2%	11	8%	13	10%	15	11%	49	37%	52	39%
31	35	setup hvy duty vertic	91	68%	5	4%	0	0%	6	5%	29	22%	16	12%	22	17%	48	36%	43	32%
32	36	setupradial drill	90	68%	4	3%	0	0%	7	5%	31	23%	23	17%	20	15%	50	38%	37	28%
33	37	setup NATCO	108	81%	2	2%	2	2%	5	4%	14	11%	12	9%	17	13%	49	37%	52	39%
34	38	setup 21'upright	90	68%	1	1%	3	2%	8	6%	29	22%	19	14%	18	14%	51	38%	42	32%
35	39	setup CNC vertical	109	82%	2	2%	0	0%	5	4%	13	10%	5	4%	14	11%	50	38%	61	46%
36	40	setup CNC horizontal	111	83%	3	2%	0	0%	3	2%	15	11%	5	4%	15	11%	50	38%	60	45%
37	41	setup Bridgeport hori	92	69%	3	2%	1	1%	9	7%	27	20%	19	14%	20	15%	48	36%	43	32%
38	42	setup CincinRise&Fall	110	83%	1	1%	0	0%	4	3%	16	12%	10	8%	19	14%	49	37%	53	40%
39	43	setup duplex twinhead	114	86%	2	2%	2	2%	6	5%	7	5%	11	8%	12	9%	50	38%	56	42%
40	44	setup Milwaukee	109	82%	1	1%	2	2%	5	4%	13	10%	15	11%	12	9%	41	31%	62	47%
41	45	setup J&L CNC chucker	113	85%	2	2%	1	1%	10	8%	6	5%	11	8%	8	6%	51	38%	59	44%
42	46	setup J&L CNC combi	116	87%	2	2%	1	1%	6	5%	6	5%	9	7%	11	8%	51	38%	60	45%
43	47	setup K&T 180	120	90%	3	2%	0	0%	5	4%	3	2%	6	5%	6	5%	46	35%	72	54%
50	54	setup horiz broaches	112	84%	3	2%	0	0%	3	2%	13	10%	8	6%	21	16%	49	37%	53	40%
53	57	setup engine lathe	89	67%	3	2%	4	3%	3	2%	33	25%	23	17%	21	16%	38	29%	48	36%
57	61	setup TBI lathe	124	93%	0	0%	2	2%	2	2%	4	3%	6	5%	7	5%	52	39%	65	49%
58	62	setup gun drill	94	71%	5	4%	2	2%	6	5%	25	19%	19	14%	17	13%	48	36%	47	35%
59	63	oper.stand end plate	100	75%	3	2%	0	0%	8	6%	22	17%	17	13%	24	18%	49	37%	40	30%
62	66	oper Seiki 3NE	84	63%	6	5%	1	1%	24	18%	15	11%	32	24%	17	13%	39	29%	43	32%
63	67	oper.Seiki 4NE	88	66%	5	4%	1	1%	20	15%	16	12%	29	22%	19	14%	39	29%	44	33%
64	68	oper.Seiki 4NEA	99	74%	4	3%	1	1%	15	11%	11	8%	21	16%	20	15%	41	31%	49	37%
71	75	oper Hobb machine	108	81%	4	3%	1	1%	10	8%	8	6%	16	12%	12	9%	43	32%	55	41%
80	84	oper.Jig Bore	126	95%	0	0%	0	0%	0	0%	4	3%	5	4%	13	10%	52	39%	60	45%
82	86	oper bench grinders	52	39%	6	5%	5	4%	25	19%	43	32%	47	35%	18	14%	31	23%	35	26%
83	87	oper. contour saw	119	89%	1	1%	2	2%	1	1%	9	7%	9	7%	15	11%	53	40%	53	40%
84	88	oper. cam grinder	124	93%	0	0%	0	0%	1	1%	5	4%	4	3%	7	5%	57	43%	63	47%
85	89	oper. Landis external	108	81%	6	5%	1	1%	7	5%	9	7%	17	13%	12	9%	47	35%	55	41%
86	90	oper Norton external	107	80%	5	4%	1	1%	8	6%	10	8%	17	13%	13	10%	45	34%	56	42%
87	91	oper. Gardner disk	120	90%	2	2%	0	0%	4	3%	5	4%	10	8%	13	10%	53	40%	55	41%
88	92	oper Cincinn thru fee	113	85%	5	4%	1	1%	5	4%	6	5%	10	8%	12	9%	53	40%	56	42%
89	93	oper.Landis plunge	116	87%	3	2%	1	1%	7	5%	4	3%	14	11%	10	8%	49	37%	57	43%
90	94	oper.Heald 271	112	84%	2	2%	3	2%	7	5%	6	5%	13	10%	10	8%	47	35%	60	45%
91	95	oper.Heald 272 plain	112	84%	2	2%	2	2%	7	5%	8	6%	14	11%	10	8%	47	35%	60	45%
92	96	oper.Heald 272sizemat	114	86%	1	1%	3	2%	7	5%	6	5%	13	10%	10	8%	48	36%	60	45%
93	97	oper. Cincin191	117	88%	3	2%	1	1%	3	2%	6	5%	11	8%	12	9%	48	36%	60	45%
94	98	oper.external stepmas	118	89%	2	2%	0	0%	5	4%	4	3%	7	5%	12	9%	54	41%	58	44%
95	99	oper.roll stamp	86	65%	5	4%	3	2%	5	4%	32	24%	24	18%	27	20%	43	32%	36	27%
96	100	oper.power press	90	68%	5	4%	1	1%	2	2%	34	26%	29	22%	23	17%	39	29%	39	29%
97	101	oper.standard Heald	108	81%	0	0%	2	2%	5	4%	16	12%	12	9%	14	11%	55	41%	47	35%
99	103	oper.transfer machine	119	89%	0	0%	0	0%	3	2%	10	8%	10	8%	15	11%	49	37%	54	41%
100	104	oper.Jones&Lamson ATL	109	82%	0	0%	2	2%	5	4%	16	12%	15	11%	12	9%	53	40%	49	37%
101	105	oper.Wheel & Brader	117	88%	1	1%	0	0%	2	2%	10	8%	12	9%	11	8%	56	42%	48	36%
102	106	oper.straightn press	94	71%	2	2%	1	1%	4	3%	30	23%	27	20%	26	20%	45	34%	32	24%

ROSTER A SECTIONS 1&2
MACHINING

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	1 NEVER f	%	2 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
103	107	oper. lapping machine		105	79%	1	1%	0	0%	4	3%	20	15%	21	16%	22	17%	45	34%	42	32%
104	108	oper heat treat furna		120	90%	1	1%	1	1%	3	2%	5	4%	5	4%	12	9%	47	35%	66	50%
105	109	oper.induction heat		121	91%	0	0%	0	0%	4	3%	3	2%	4	3%	12	9%	45	34%	69	52%
106	110	oper.4-6spindle		107	80%	3	2%	2	2%	4	3%	14	11%	14	11%	17	13%	52	39%	46	35%
107	111	oper.radial drill		88	66%	2	2%	2	2%	5	4%	34	26%	23	17%	30	23%	43	32%	35	26%
108	112	oper.NATCO multi		109	82%	1	1%	3	2%	4	3%	14	11%	15	11%	21	16%	51	38%	44	33%
109	113	oper.24'upright singl		93	70%	3	2%	1	1%	6	5%	27	20%	24	18%	25	19%	45	34%	37	28%
110	114	oper.OKATA CNC		119	89%	0	0%	1	1%	4	3%	6	5%	9	7%	12	9%	52	39%	57	43%
114	118	oper.Bridgeport verti		81	61%	6	5%	2	2%	6	5%	35	26%	26	20%	17	13%	52	39%	34	26%
115	119	oper Cincin Rise&Fall		106	80%	2	2%	0	0%	3	2%	20	15%	13	10%	21	16%	54	41%	43	32%
116	120	oper.duplex-twin		104	78%	2	2%	1	1%	6	5%	16	12%	14	11%	22	17%	46	35%	45	34%
117	121	oper Milwaukee		107	80%	1	1%	1	1%	7	5%	15	11%	17	13%	19	14%	46	35%	49	37%
118	122	oper. J&L CNC chucker		101	76%	4	3%	0	0%	11	8%	14	11%	19	14%	15	11%	47	35%	50	38%
119	123	oper.J&L CNC combi		111	83%	4	3%	0	0%	6	5%	9	7%	13	10%	16	12%	51	38%	51	38%
120	124	oper Shaffner		113	85%	1	1%	0	0%	11	8%	3	2%	12	9%	9	7%	53	41%	55	41%
121	125	oper. oper K&T 180		118	89%	2	2%	0	0%	6	5%	4	3%	10	8%	11	8%	48	36%	62	47%
124	128	oper.Marvel saw		109	82%	3	2%	0	0%	6	5%	12	9%	13	10%	26	20%	46	35%	46	35%
131	135	oper. Vibro machine		99	74%	2	2%	1	1%	18	14%	10	8%	24	18%	21	16%	55	41%	30	23%
135	139	oper.barrel machine		120	90%	0	0%	0	0%	3	2%	8	6%	6	5%	27	20%	57	43%	38	29%
136	140	oper.big wash		108	81%	2	2%	1	1%	5	4%	15	11%	10	8%	36	27%	53	40%	28	21%
137	141	oper.derust wash		112	84%	0	0%	1	1%	5	4%	14	11%	9	7%	36	27%	56	42%	30	23%
138	142	oper.paint booth		113	85%	2	2%	0	0%	2	2%	15	11%	7	5%	35	26%	56	42%	33	25%
139	143	oper.powder coating		119	89%	2	2%	1	1%	3	2%	8	6%	6	5%	29	22%	58	44%	37	28%
140	144	oper.spin finish		121	91%	0	0%	0	0%	2	2%	8	6%	5	4%	31	23%	59	44%	36	27%
141	145	oper.buffing lathe		113	85%	1	1%	1	1%	1	1%	13	10%	7	5%	24	18%	65	49%	32	24%
142	146	oper. disc sander		87	65%	6	5%	2	2%	3	2%	33	25%	30	23%	26	20%	49	37%	25	19%
143	147	oper.float sander		107	80%	2	2%	1	1%	2	2%	17	13%	17	13%	28	21%	56	42%	29	22%
144	148	oper.belt sandner		57	43%	7	5%	2	2%	15	11%	48	36%	47	35%	29	22%	35	26%	19	14%
151	155	read Height&flatness	x	16	12%	6	5%	5	4%	92	69%	12	9%	104	78%	15	11%	5	4%	6	5%
153	157	maintain crib service	x	79	59%	5	4%	0	0%	28	21%	17	13%	60	45%	35	26%	27	20%	10	8%
154	158	maintain tool invento	x	58	44%	10	8%	4	3%	34	26%	24	18%	64	48%	27	20%	27	20%	12	9%
163	167	asasemble components	x	65	49%	9	7%	5	4%	21	16%	31	23%	50	38%	35	26%	31	23%	14	11%
164	168	oper.robot cell		115	86%	0	0%	3	2%	4	3%	8	6%	13	10%	29	22%	41	31%	48	36%
165	169	stamp ID on part		75	56%	5	4%	1	1%	10	8%	39	29%	54	41%	37	28%	23	17%	16	12%
167	171	assemble 2 or more pa		49	37%	9	7%	0	0%	20	15%	53	40%	80	60%	26	20%	18	14%	6	5%
170	174	oper. furnace		117	88%	2	2%	1	1%	3	2%	5	4%	8	6%	14	11%	53	40%	56	42%
171	175	use Rockwell hardness		106	80%	4	3%	1	1%	3	2%	17	13%	14	11%	25	19%	51	38%	40	30%
172	176	oper. black oxide		122	92%	0	0%	1	1%	2	2%	4	3%	7	5%	16	12%	57	43%	50	38%
173	177	oper forge furnace		125	94%	1	1%	1	1%	0	0%	2	2%	3	2%	15	11%	56	42%	56	42%
175	179	oper.upset hammer		125	94%	1	1%	0	0%	0	0%	3	2%	7	5%	15	11%	55	41%	52	39%
176	180	oper. Richard's bende		123	92%	1	1%	0	0%	0	0%	5	4%	4	3%	19	14%	50	38%	55	41%
177	181	sharpen drills	x	55	41%	10	8%	5	4%	28	21%	31	23%	57	43%	32	24%	20	15%	20	15%
191	196	assist w/repair		39	29%	16	12%	6	5%	56	42%	14	11%	81	61%	21	16%	15	11%	11	8%
192	196	assist w/troubleshoot		13	10%	17	13%	4	3%	83	62%	12	9%	100	75%	16	12%	5	4%	7	5%

ROSTER B SECTIONS 3 & 4
NON-MACHINING

				3		4		3		4		5		1		2		3		4	
QUESTION #			GEN'L KNLGE	NEVER		>1/MO		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED TR'NG	
PT 1	PT 2	task		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
146	150	read micrometers	X	28	22	10	8	9	7	40	32	35	28	67	55	16	13	14	12	24	20
152	156	use basic math	X	31	25	5	4	2	2	59	47	26	21	82	68	10	8	12	10	17	14
145	149	read blueprints	X	22	18	7	6	6	5	35	28	39	31	54	45	22	18	22	18	22	18
185	190	arrange for service		75	60	2	2	0	0	20	16	25	20	44	36	25	21	21	17	28	23
180	184	load/unload machine		56	45	1	1	1	1	29	23	34	27	57	47	14	12	18	15	30	25
190	195	assist in troubleshoo		49	39	3	2	6	5	38	30	27	22	62	51	19	16	17	14	22	18
186	191	check part to print	X	44	35	6	5	5	4	33	26	36	29	67	55	17	14	13	11	23	19
155	159	use Vernier calipers	X	55	44	5	4	6	5	32	26	26	21	60	50	13	11	18	15	29	24
169	173	use depth gages	X	65	52	6	5	0	0	23	18	30	24	44	36	16	13	22	18	37	31
166	170	read WIP forms	X	69	55	8	6	1	1	24	19	21	17	42	35	14	12	25	21	34	28
181	186	obtain tooling		45	36	0	0	1	1	42	34	35	28	74	61	18	15	14	12	14	12
188	193	mount material		73	58	1	1	2	2	21	17	27	22	47	39	14	12	19	16	39	32
189	194	change fixture		73	58	0	0	1	1	21	17	29	23	44	36	12	10	23	19	41	34
158	162	use trigonometry	X	112	90	1	1	1	1	0	0	9	7	3	2	6	5	24	20	87	71
178	182	read Machinist handbk	X	69	55	7	6	1	1	14	11	32	26	54	45	14	12	18	15	32	26
156	160	use Johannson blocks	X	78	62	3	2	1	1	23	18	19	15	42	35	15	12	21	17	40	33
157	161	use Machinist handbk	X	74	59	9	7	1	1	15	12	25	20	41	34	23	19	20	17	37	31
159	163	read complicated draw	X	65	52	6	5	4	3	21	17	27	22	21	17	27	22	30	25	43	36
160	164	use depth gage	X	47	38	6	5	4	3	26	21	37	30	51	42	20	17	21	17	29	24
161	165	use shadow gage	X	72	58	5	4	2	2	14	11	31	25	42	35	20	17	26	21	31	26
162	166	use radius gage	X	66	53	4	3	2	2	20	16	32	26	48	40	16	13	23	19	31	26
149	153	measure to .0001"	X	44	35	4	3	5	4	28	22	41	33	61	60	13	11	23	19	24	20
183	188	assist w/ maintenance	X	66	53	3	2	0	0	24	19	31	25	50	41	28	23	21	17	19	16
150	154	measure to 1/64"	X	42	34	4	3	3	2	35	28	38	30	62	51	12	10	20	17	25	21
179	183	adjust machine		58	46	2	2	0	0	29	23	34	27	51	42	14	12	17	14	36	30
182	187	clean,oil,lubricate		49	39	1	1	1	1	35	28	38	30	68	56	22	18	15	12	15	12
78	82	oper.milling machines		99	79	1	1	1	1	6	5	16	13	7	6	18	15	33	27	63	52
111	115	oper.Bridgeport CNCmi		115	92	0	0	0	0	2	2	6	5	5	4	6	5	33	27	77	64
112	116	oper.Cincinnati horiz		104	83	0	0	0	0	4	3	14	11	9	7	10	8	30	25	72	60
113	117	oper.Cincinnati verti		106	85	0	0	1	1	2	2	13	10	3	7	9	7	33	27	71	59
70	74	oper.surface grinder		107	86	2	2	0	0	1	1	13	10	6	5	9	7	34	36	62	51
12	16	setup drill press		71	57	6	5	4	4	5	4	37	30	29	24	27	22	32	26	33	27
17	21	setup Cin thru feed		117	94	0	0	1	1	0	0	5	4	1	1	3	2	37	31	80	66
60	64	oper.drill press		65	52	4	3	4	3	6	5	43	34	23	19	28	23	31	26	38	31
147	151	read concentricity ga	X	55	44	6	5	2	2	28	22	31	25	45	37	25	21	18	15	33	27
184	189	load tape in NC		102	82	0	0	1	1	7	6	13	10	12	10	14	12	34	28	59	49
187	192	program machine		106	85	0	0	1	1	10	8	7	6	17	14	11	9	27	22	64	53
79	83	oper.lathe		90	72	3	2	1	1	6	5	24	19	8	7	20	17	35	29	58	48
13	17	setup Bridgeport mill		96	17	4	3	2	2	5	4	17	14	15	12	11	9	34	28	61	50
51	55	setup MSO		118	94	0	0	0	0	2	2	3	2	4	3	1	1	33	27	83	69
61	65	oper. Bridgeport mill		96	77	2	2	3	2	5	4	17	14	15	12	14	12	29	24	57	47
66	70	oper.Cinnati Monosett		122	98	0	0	0	0	0	0	1	1	1	1	4	3	33	27	80	66
67	71	oper.Heald tool grind		121	97	0	0	0	0	0	0	2	2	1	1	6	5	35	29	79	65
68	72	oper. Norton surface		112	90	0	0	0	0	1	1	10	8	3	2	9	7	40	33	69	57
69	73	oper.drill grinder		109	87	2	2	0	0	1	1	10	8	4	3	14	12	40	33	63	52
72	76	oper.cutter & tool		120	96	1	1	0	0	0	0	2	2	0	0	6	5	37	31	78	64
73	77	oper.tap grind		121	97	0	0	0	0	0	0	2	2	0	0	4	3	43	36	74	61

ROSTER B SECTIONS 3 & 4
NON-MACH'

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	3 NEVER f	%	4 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
74	78	oper.thread chaser		116	93	2	2	0	0	0	0	5	4	2	2	8	7	36	30	75	62
75	79	oper.Gleason cutter		122	98	0	0	0	0	0	0	1	1	0	0	5	4	34	28	82	69
129	133	oper. MSC machine		109	87	0	0	0	0	1	1	13	10	5	4	4	3	32	26	79	65
148	152	read plug gages	X	40	32	7	6	3	2	31	25	41	33	60	50	16	13	20	17	25	21
14	18	setup Sunnen		114	91	2	2	0	0	2	2	5	4	4	3	11	9	33	27	71	59
28	32	setup Potter&Johnson		111	89	2	2	0	0	1	1	9	7	5	4	6	5	37	31	72	60
44	48	setup Scimmx		116	93	1	1	0	0	1	1	3	2	2	2	1	1	32	26	85	70
65	69	oper.Sunnen horiz		114	91	1	1	2	2	1	1	5	4	3	2	9	7	36	30	72	60
76	80	oper.single point car		121	97	0	0	0	0	0	0	2	2	0	0	7	6	37	31	77	64
81	85	oper.surface grinder		107	86	2	2	0	0	2	2	12	10	4	3	9	7	43	36	65	54
122	126	oper. Scimmx		118	94	0	0	0	0	2	2	1	1	1	1	5	4	30	25	84	69
174	178	use slip gages	X	98	78	2	2	2	2	10	8	11	9	19	16	17	14	34	28	49	40
11	15	setup Standard endpla		109	87	2	2	1	1	0	0	11	9	8	7	7	6	33	27	72	60
25	29	setup Standard Heald		115	92	1	1	0	0	1	1	6	5	3	2	4	3	32	26	82	68
26	30	setup Horizontal turr		95	76	4	3	1	1	2	2	20	16	8	7	10	8	32	26	68	56
29	33	setup Warner SwazyAC		112	92	2	2	0	0	0	0	9	7	3	2	7	6	36	30	75	62
45	49	setup DoAll saw		98	78	2	2	0	0	6	5	16	13	8	7	12	10	39	32	61	50
46	50	setup Wagner saw		113	90	1	1	0	0	3	2	7	6	1	1	11	9	43	36	65	54
47	51	setup Barber-Coleman		120	96	1	1	0	0	1	1	1	1	0	0	6	5	31	26	84	69
48	52	setup Anvill Mill		112	90	1	1	0	0	2	2	8	6	1	1	8	7	30	25	81	67
49	53	setup vertical broach		107	86	1	1	0	0	0	0	15	12	4	3	9	7	35	29	74	61
52	56	setup Burke twin mill		120	96	0	0	0	0	0	0	3	2	0	0	5	4	32	26	84	69
54	58	setup multiple spindl		109	87	3	2	0	0	0	0	11	9	4	3	6	5	32	26	79	65
55	59	setup automatic screw		108	86	2	2	0	0	1	1	13	10	6	5	7	6	32	26	76	63
56	60	setup gear shaper		115	92	2	2	0	0	0	0	5	4	0	0	6	5	30	25	85	70
77	81	oper.Sunnen precision		118	94	1	1	0	0	1	1	3	2	5	4	7	6	36	30	72	60
98	102	oper.Heald borematic		116	93	0	0	0	0	1	1	6	5	1	1	12	10	26	21	81	67
123	127	oper.DoAll Saw		102	82	1	1	1	1	3	2	15	12	10	8	15	12	40	33	56	46
125	129	oper.Wagner saw		112	90	1	1	0	0	2	2	8	6	3	2	13	11	45	37	60	50
127	131	oper.Anvill Mill		121	97	0	0	0	0	0	0	2	2	4	3	6	5	34	28	77	64
128	132	oper.vertical broache		116	93	0	0	0	0	1	1	5	4	6	5	10	8	35	29	70	58
130	130	oper. BarberColeman		116	93	0	0	0	0	2	2	4	3	1	1	5	4	32	26	83	69
130	134	oper.Burke twin mill		122	98	0	0	0	0	0	0	1	1	4	3	2	2	36	30	79	65
132	136	oper.multiple spindle		113	90	0	0	0	0	0	0	10	8	3	2	9	7	35	29	74	61
133	137	oper.automatic screw		109	87	0	0	0	0	1	1	14	13	5	4	10	8	34	28	71	59
134	138	oper.gear shaper		117	94	0	0	0	0	0	0	5	4	2	2	6	5	34	28	78	64
168	172	use dial bar gages	X	77	62	3	2	1	1	19	15	24	19	34	28	20	17	28	23	37	31
8	12	setup Seike 3NE		115	92	0	0	0	0	2	2	4	3	3	2	7	6	37	31	74	61
9	13	setup Seike 4NE		118	94	0	0	1	1	1	1	1	1	3	2	4	3	38	31	76	63
10	14	setup Seike 4NEA		116	93	1	1	1	1	1	1	1	1	3	2	3	2	39	32	76	63
15	19	setup Landis external		116	93	2	2	0	0	1	1	4	3	3	2	3	2	38	31	76	63
16	20	setup Gardner disk		116	93	1	1	0	0	2	2	4	3	2	2	3	2	37	31	79	65
18	22	setup Landis plunge		118	94	0	0	0	0	0	0	5	4	3	2	3	2	34	28	81	67
19	23	setup Heald 271		119	95	0	0	0	0	0	0	4	3	3	2	4	3	32	26	82	68
20	24	setup Heald 272plain		118	94	0	0	0	0	0	0	4	3	3	2	3	2	34	28	80	66
21	25	setup Heald 272sizema		118	94	1	1	0	0	0	0	4	3	3	2	4	3	33	27	81	67
22	26	setup Cincinnati 181		118	94	2	2	0	0	0	0	3	2	1	1	4	3	35	29	81	67

ROSTER B   SECTIONS 3 & 4
NON-MACH'

QUESTION # PT 1	PT 2	task	GEN'L KNLGE 3 NEVER f	%	4 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
23	27	setup external stepma	120	96	1	1	0	0	0	0	2	2	1	1	3	2	35	29	82	68
24	28	setup standard Heald	115	92	0	0	0	0	1	1	7	6	2	2	7	6	29	24	83	67
27	31	setup transfer machin	117	94	0	0	0	0	2	2	3	2	2	2	6	5	37	31	76	63
30	34	setup 4-6 spindle	100	80	3	2	0	0	2	2	19	15	14	12	6	5	33	27	65	56
31	35	setup hvy duty vertic	98	78	2	2	0	0	2	2	22	18	14	12	9	7	32	26	66	55
32	36	setupradial drill	97	78	3	2	0	0	2	2	22	18	13	11	11	9	34	28	63	52
33	37	setup NATCO	103	82	1	1	0	0	2	2	17	14	9	7	10	8	38	31	64	53
34	38	setup 21'upright	91	73	3	2	0	0	3	2	27	22	15	12	11	9	38	31	57	47
35	39	setup CNC vertical	116	93	1	1	0	0	2	2	5	4	4	3	6	5	35	29	76	63
36	40	setup CNC horizontal	115	92	1	1	1	1	3	2	3	2	3	2	5	4	34	28	78	64
37	41	setup Bridgeport hor:	101	81	3	2	0	0	4	3	15	12	11	9	10	8	32	26	68	56
38	42	setup CincinRise&Fall	110	88	0	0	0	0	2	2	11	9	5	4	5	4	32	26	79	65
39	43	setup duplex twinhead	110	88	1	1	0	0	2	2	9	7	5	4	5	4	29	24	81	67
40	44	setup Milwaukee	109	87	1	1	0	0	3	2	6	5	6	5	3	2	30	23	82	63
41	45	setup J&L CNC chucker	114	91	1	1	0	0	2	2	5	4	3	2	2	2	36	30	79	65
42	46	setup J&L CNC combi	115	92	2	2	1	1	0	0	5	4	0	0	4	3	37	31	79	65
43	47	setup K&T 180	117	94	2	2	0	0	0	0	4	3	2	2	2	2	33	27	82	69
50	54	setup horiz broaches	109	87	1	1	0	0	1	1	12	10	4	3	8	7	33	27	75	62
53	57	setup engine lathe	107	86	2	2	0	0	1	1	13	10	5	4	6	5	35	29	75	62
57	61	setup TBI lathe	112	90	2	2	0	0	1	1	8	6	2	2	9	7	29	24	81	67
58	62	setup gun drill	109	87	2	2	2	2	0	0	10	8	3	2	9	7	34	28	75	62
59	63	oper.stand end plate	109	87	1	1	1	1	0	0	12	10	8	7	10	8	33	27	68	56
62	66	oper Seiki 3NE	117	94	2	2	0	0	0	0	5	4	2	2	10	8	36	30	72	60
63	67	oper.Seiki 4NE	118	94	1	1	0	0	2	2	2	2	0	0	11	9	36	30	73	60
64	68	oper.Seiki 4NEA	118	94	1	1	0	0	2	2	2	2	0	0	11	9	3	30	73	60
71	75	oper Hobb machine	120	96	0	0	0	0	0	0	3	2	0	0	7	6	35	29	79	65
80	84	oper.Jig Bore	120	96	0	0	0	0	0	0	3	2	0	0	4	3	36	30	81	67
82	86	oper bench grinders	72	58	5	4	4	3	12	10	30	24	24	20	18	15	27	22	52	43
83	87	oper. contour saw	111	89	1	1	0	0	1	1	11	9	2	2	12	10	41	34	65	54
84	88	oper. cam grinder	122	98	0	0	0	0	0	0	1	1	1	1	4	3	34	28	82	68
85	89	oper. Landis external	116	94	0	0	0	0	0	0	5	4	2	2	5	4	37	31	76	63
86	90	oper Norton external	117	94	0	0	0	0	0	0	6	5	2	2	5	4	38	31	76	63
87	91	oper. Gardner disk	119	95	0	0	0	0	1	1	3	2	1	1	6	5	35	29	79	65
88	92	oper Cincinn thru fee	119	95	0	0	0	0	0	0	4	3	0	0	6	5	34	28	81	67
89	93	oper.Landis plunge	120	96	0	0	0	0	0	0	3	2	3	2	3	2	32	26	83	69
90	94	oper.Heald 271	119	95	0	0	0	0	0	0	3	2	1	1	6	5	33	27	81	67
91	95	oper.Heald 272 plain	120	96	0	0	0	0	0	0	3	2	1	1	6	5	33	27	80	66
92	96	oper.Heald 272sizemat	120	96	0	0	0	0	0	0	3	2	2	2	5	4	33	27	80	66
93	97	oper. Cincin181	121	97	0	0	0	0	0	0	2	2	0	0	5	4	33	27	82	68
94	98	oper.external stepmas	120	96	0	0	1	1	0	0	2	2	1	1	3	2	33	27	83	69
95	99	oper.roll stamp	82	66	4	3	8	6	11	9	16	13	18	15	34	28	23	19	46	38
96	100	oper.power press	78	62	8	6	3	2	17	14	19	14	28	23	27	22	26	21	40	33
97	101	oper.standard Heald	116	93	0	0	0	0	0	0	7	6	0	0	12	10	28	23	80	66
99	103	oper.transfer machine	117	94	1	1	0	0	1	1	4	3	1	1	8	7	32	26	78	64
100	104	oper.Jones&Lamson ATL	109	87	0	0	2	2	1	1	11	9	3	2	12	10	28	23	77	64
101	105	oper.Wheel & Brader	111	89	0	0	0	0	2	2	10	8	6	5	11	9	37	31	65	54
102	106	oper.straightn press	104	83	1	1	1	1	2	2	15	12	9	7	17	14	40	33	55	45

ROSTER B SECTIONS 3 & 4
NON-MACH'

QUESTION # PT 1	QUESTION # PT 2	task	GEN'L KNLGE	3 NEVER		4 >1/MO		3 MONTHLY		4 REGULARLY		5 IN PAST		1 CAN DO		2 W/HELP		3 SIMILAR		4 NEED TR'NG	
				#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
103	107	oper. lapping machine		113	90	0	0	0	0	1	1	9	7	5	4	16	13	34	28	66	55
104	108	oper heat treat furna		114	91	0	0	0	0	2	2	6	5	1	1	9	7	32	26	80	66
105	109	oper.induction heat		116	93	0	0	0	0	2	2	5	4	3	2	6	5	32	26	80	66
106	110	oper.4-6spindle		99	79	0	0	0	0	1	1	24	19	11	9	10	8	37	31	63	52
107	111	oper.radial drill		95	76	1	1	0	0	1	1	27	22	12	10	19	15	36	30	54	45
108	112	oper.NATCO multi		104	83	1	1	0	0	0	0	18	14	10	8	12	10	35	29	64	53
109	113	oper.24'upright singl		95	76	0	0	1	1	3	2	24	19	11	9	13	11	41	34	56	46
110	114	oper.OKATA CNC		115	92	0	0	0	0	3	2	3	2	4	3	4	3	35	29	78	64
114	118	oper.Bridgeport verti		100	80	1	1	1	1	4	3	16	13	10	8	11	9	32	26	68	56
115	119	oper Cincin Rise&Fall		110	88	0	0	0	0	2	2	10	8	5	4	10	8	29	24	77	64
116	120	oper.duplex-twin		110	88	0	0	0	0	2	2	11	9	6	5	7	6	28	23	78	64
117	121	oper Milwaukee		112	90	0	0	0	0	2	2	8	6	7	6	5	4	31	26	78	64
118	122	oper. J&L CNC chucker		116	93	0	0	0	0	2	2	4	3	5	4	4	3	36	30	75	62
119	123	oper.J&L CNC combi		118	94	0	0	0	0	2	2	2	2	3	2	5	4	35	29	78	64
120	124	oper Shaffner		116	93	0	0	0	0	2	2	4	3	2	2	6	5	32	26	81	67
121	125	oper. oper K&T 180		115	92	0	0	0	0	2	2	4	3	3	2	4	3	30	25	83	69
124	128	oper.Marvel saw		114	91	1	1	0	0	1	1	8	6	5	4	12	10	44	36	60	50
131	135	oper. Vibro machine		106	85	2	2	1	1	2	2	12	10	9	7	17	14	40	33	55	45
135	139	oper.barrel machine		113	90	0	0	0	0	1	1	8	6	4	3	16	13	43	36	57	47
136	140	oper.big wash		103	82	0	0	0	0	4	3	16	13	15	12	28	23	43	36	34	28
137	141	oper.derust wash		101	81	0	0	1	1	4	3	17	14	16	13	31	26	42	35	31	26
138	142	oper.paint booth		95	76	1	1	3	2	5	4	20	16	17	14	35	29	37	31	31	26
139	143	oper.powder coating		117	94	0	0	1	1	2	2	3	2	4	3	34	28	46	38	37	31
140	144	oper.spin finish		118	94	0	0	0	0	0	0	5	4	3	2	24	20	47	39	47	39
141	145	oper.buffing lathe		111	89	1	1	1	1	0	0	11	9	9	7	22	13	42	35	48	40
142	146	oper. disc sander		92	74	2	2	2	2	6	5	21	17	18	15	28	23	35	29	40	33
143	147	oper.float sander		111	89	0	0	1	1	2	2	9	7	9	7	30	25	36	30	46	38
144	148	oper.belt sandner		67	54	4	3	2	2	12	10	37	30	26	21	28	23	35	29	31	26
151	155	read Height&flatness	X	61	49	1	1	3	2	24	19	35	28	49	40	21	17	23	19	27	22
153	157	maintain crib service	X	79	63	4	3	3	2	16	13	22	18	45	37	27	22	25	21	21	17
154	158	maintain tool invento	X	71	57	4	3	3	2	19	15	27	22	45	37	29	24	26	21	20	17
163	167	asasemble components	X	49	39	2	2	1	1	45	36	25	20	52	43	24	20	25	21	18	15
164	168	oper.robot cell		106	85	0	0	2	2	5	4	9	7	12	10	28	23	36	30	44	36
165	169	stamp ID on part		49	39	4	3	9	7	30	24	30	24	57	47	29	24	21	17	11	9
167	171	assemble 2 or more pa		34	27	2	2	2	2	50	40	32	26	71	59	21	17	13	11	15	12
170	174	oper. furnace		110	88	0	0	0	0	3	2	9	7	4	3	15	12	40	33	60	50
171	175	use Rockwell hardness		98	78	3	2	0	0	8	6	15	12	20	17	15	12	35	29	50	41
172	176	oper. black oxide		119	95	0	0	0	0	2	2	3	2	4	3	13	11	38	31	64	53
173	177	oper forge furnace		120	96	1	1	0	0	1	1	1	1	2	2	11	9	40	33	66	55
175	179	oper.upset hammer		120	96	1	1	0	0	0	0	2	2	2	2	9	7	41	34	67	55
176	180	oper. Richard's bende		117	94	1	1	0	0	1	1	3	2	2	2	8	7	40	33	68	56
177	181	sharpen drills	X	64	51	5	4	3	2	11	9	40	32	36	30	23	19	29	24	31	26
191	196	assist w/repair		71	57	3	2	5	4	15	12	30	24	40	33	25	21	28	23	25	21
192	196	assist w/troubleshoot		40	32	5	4	9	7	40	32	29	23	61	50	21	17	17	14	21	17

File: MASTER C

ROSTER C SECTIONS 5 & 6

SKILLED MACHINE

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	5 NEVER f	%	6 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
146	150	read micrometers	X	4	13	0	0	0	0	24	80	2	7	27	90	0	0	2	7	1	3
152	156	use basic math	X	3	10	1	3	0	0	25	83	1	3	28	93	0	0	1	3	1	3
145	149	reac blueprints	X	4	13	0	0	0	0	24	80	2	7	24	80	3	10	1	3	2	7
185	190	arrange for service		9	30	5	17	0	0	13	43	3	10	19	63	4	13	5	17	2	7
180	184	load/unload machine		6	20	0	0	0	0	22	73	2	7	25	83	1	3	1	3	3	10
190	195	assist in troubleshoo		4	13	2	7	0	0	22	73	2	7	24	80	2	7	3	10	1	3
186	191	check part to print	X	4	13	1	3	0	0	21	70	4	13	24	80	2	7	2	7	2	7
155	159	use Vernier calipers	X	4	13	1	3	1	3	22	73	2	7	26	87	0	0	1	3	3	10
169	173	use depth gages	X	9	30	3	10	3	10	11	37	4	13	20	67	4	13	2	7	4	13
166	170	read WIP forms	X	20	67	2	7	1	3	2	7	5	17	9	30	9	30	7	23	5	17
181	186	obtain tooling		4	13	0	0	0	0	23	77	3	10	26	87	3	10	1	3	0	0
188	193	mount material		5	17	0	0	1	3	20	67	4	13	23	77	1	3	3	10	3	10
189	194	change fixture		5	17	0	0	0	0	20	67	5	17	24	80	1	3	2	7	3	10
158	162	use trigonometry	X	11	37	2	7	4	13	12	40	1	3	13	43	8	27	2	7	6	20
178	182	read Machinist handbk	X	5	17	6	20	4	13	8	27	7	23	25	83	1	3	2	7	2	7
156	160	use Johannson blocks	X	6	20	2	7	1	3	20	67	1	3	25	83	1	3	1	3	3	10
157	161	use Machinist handbk	X	5	17	5	17	2	7	12	40	6	20	23	77	1	3	3	10	2	7
159	163	read complicated draw	X	5	17	0	0	1	3	19	63	5	17	19	63	6	20	1	3	4	13
160	164	use depth gage	X	5	17	0	0	2	7	18	60	5	17	24	80	1	3	1	3	4	13
161	165	use shadow gage	X	11	37	4	13	1	3	9	30	5	17	20	67	5	17	1	3	4	13
162	166	use radius gage	X	6	20	1	3	3	10	16	53	4	13	24	80	2	7	2	7	2	7
149	153	measure to .0001"	X	5	17	0	0	1	3	21	70	2	7	26	87	0	0	1	3	3	10
183	188	assist w/ maintenance	X	6	20	1	3	1	3	18	60	4	13	23	77	3	10	2	7	2	7
150	154	measure to 1/64"	X	4	13	0	0	0	0	24	80	1	3	27	90	0	0	1	3	2	7
179	183	adjust machine		6	20	0	0	0	0	21	70	3	10	25	83	0	0	2	7	3	10
182	187	clean,oil,lubricate		5	17	0	0	0	0	22	73	3	10	26	87	1	3	1	3	2	7
78	82	oper.milling machines		8	27	0	0	1	3	12	40	9	30	19	63	3	10	4	13	4	13
111	115	oper.Bridgeport CNCmi		28	93	0	0	1	3	0	0	1	3	4	13	2	7	16	53	8	27
112	116	oper.Cincinnati horiz		8	27	0	0	1	3	12	40	9	30	18	60	3	10	5	17	4	13
113	117	oper.Cincinnati verti		8	27	3	10	1	3	8	27	10	33	17	57	4	13	5	17	4	13
70	74	oper.surface grinder		9	30	0	0	1	3	13	43	7	23	18	60	2	7	4	13	6	20
12	16	setup drill press		9	30	1	3	1	3	11	9	8	27	19	63	3	10	6	20	2	7
17	21	setup Cin thru feed		28	93	1	3	0	0	1	3	0	0	1	3	4	13	19	63	6	20
60	64	oper.drill press		8	27	0	0	1	3	13	43	8	27	20	67	2	7	6	20	2	7
147	151	read concentricity ga	X	5	17	1	3	2	7	18	60	4	13	26	87	0	0	1	3	3	10
184	189	load tape in NC		18	60	1	3	0	0	3	10	8	27	9	30	7	23	8	27	6	20
187	192	program machine		15	50	1	3	1	3	9	30	4	13	12	40	3	10	8	27	7	23
79	83	oper.lathe		7	23	1	3	2	7	12	40	8	27	19	63	3	10	4	13	4	13
13	17	setup Bridgeport mill		7	23	0	0	0	0	13	43	10	33	20	67	2	7	4	13	4	13
51	55	setup MSO		29	97	0	0	0	0	0	0	1	3	0	0	4	13	18	60	7	23
61	65	oper. Bridgeport mill		8	27	1	3	0	0	12	40	9	30	20	67	2	7	4	13	4	13
66	70	oper.Cinnati Monosett		13	43	0	0	2	7	10	33	5	17	15	50	3	10	6	20	6	20
67	71	oper.Heald tool grind		17	57	1	3	0	0	7	23	5	17	12	40	4	13	7	23	7	23
68	72	oper. Norton surface		10	33	2	7	1	3	11	37	6	20	15	50	3	10	5	17	7	23
69	73	oper.drill grinder		12	40	0	0	3	10	7	23	8	27	17	57	3	10	3	10	7	23
72	76	oper.cutter & tool		11	37	3	10	2	7	7	23	7	23	14	47	2	7	7	23	7	23

ROSTER C SECTIONS 5 & 6
SKILLED MACHINE

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	5 NEVER f	%	6 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
73	77	oper.tap grind		14	47	3	10	2	7	5	17	6	20	14	47	2	7	7	23	7	23
74	78	oper.thread chaser		17	57	0	0	0	0	7	23	6	20	11	37	6	20	6	20	7	23
75	79	oper.Gleason cutter		16	53	3	10	0	0	5	17	6	20	8	27	4	13	10	33	8	27
129	133	oper. MSO machine		29	97	0	0	1	3	0	0	0	0	0	0	6	20	17	57	7	23
148	152	read plug gages	X	6	20	0	0	0	0	20	67	4	13	25	83	0	0	1	3	4	13
14	18	setup Sunnen		14	47	6	20	2	7	4	13	4	13	11	37	4	13	10	33	5	17
28	32	setup Potter&Johnson		24	80	2	7	0	0	0	0	4	13	0	0	3	10	21	70	6	20
44	48	setup Scimmx		29	97	1	3	0	0	0	0	0	0	0	0	2	7	18	60	10	33
65	69	oper.Sunnen horiz		18	60	2	7	1	3	6	20	3	10	11	37	3	10	10	33	6	20
76	80	oper.single point car		14	47	1	3	2	7	6	20	7	23	15	50	1	3	7	23	7	23
81	85	oper.surface grinder		9	30	0	0	1	3	14	47	6	20	18	60	3	10	3	10	6	20
122	126	oper. Scimmx		29	97	0	0	1	3	0	0	0	0	1	3	2	7	19	63	8	27
174	178	use slip gages	X	20	67	1	3	1	3	5	17	3	10	11	37	6	20	9	30	4	13
11	15	setup Standard endpla		27	90	1	3	1	3	0	0	1	3	1	3	4	13	19	63	6	20
25	29	setup Standard Heald		29	97	0	0	0	0	1	3	0	0	0	0	1	3	22	73	7	23
26	30	setup Horizontal turr		18	60	3	10	2	7	1	3	6	20	3	10	7	23	15	50	5	17
29	33	setup Warner SwazyAC		26	87	1	3	1	3	0	0	2	7	0	0	3	10	20	67	7	23
45	49	setup DoAll saw		11	37	2	7	1	3	11	37	5	17	16	53	4	13	7	23	3	10
46	50	setup Wagner saw		26	87	0	0	1	3	0	0	3	10	3	10	9	30	14	47	4	13
47	51	setup Barber-Coleman		26	87	1	3	1	3	0	0	2	7	3	10	4	13	16	53	7	23
48	52	setup Anvill Mill		26	87	0	0	1	3	0	0	3	10	0	0	6	20	17	57	7	23
49	53	setup vertical broach		26	87	1	3	1	3	0	0	2	7	3	10	5	17	16	53	6	20
52	56	setup Burke twin mill		27	90	1	3	0	0	0	0	2	7	1	3	8	27	15	50	6	20
54	58	setup multiple spindl		24	80	1	3	0	0	ERROR	0	4	13	1	3	6	20	17	57	6	20
55	59	setup automatic screw		24	80	1	3	0	0	1	3	3	10	2	7	3	10	19	63	6	20
56	60	setup gear shaper		25	83	0	0	1	3	0	0	3	10	2	7	2	7	19	63	7	23
77	81	oper.Sunnen precision		15	50	3	10	4	13	3	10	5	17	11	37	2	7	9	30	7	23
98	102	oper.Heald borematic		29	97	0	0	0	0	1	3	0	0	0	0	3	10	19	63	8	27
123	127	oper.DoAll Saw		10	33	1	3	2	7	10	33	7	23	18	60	4	13	5	17	3	10
125	129	oper.Wagner saw		28	93	0	0	1	3	0	0	1	3	3	10	10	33	11	37	6	20
126	130	oper. BarberColeman		25	83	0	0	2	7	0	0	3	10	3	10	1	3	18	60	8	27
127	131	oper.Anvill Mill		27	90	1	3	0	0	0	0	2	7	0	0	5	17	18	60	7	23
128	132	oper.vertical broache		24	80	0	0	1	3	0	0	4	13	3	10	6	20	15	50	6	20
130	134	oper.Burke twin mill		26	87	0	0	0	0	1	3	3	10	1	3	7	23	14	47	7	23
132	136	oper.multiple spindle		27	90	0	0	2	7	0	0	0	0	0	0	5	17	19	63	6	20
133	137	oper.automatic screw		24	80	1	3	1	3	1	3	3	10	1	3	6	4	17	57	6	20
134	138	oper.gear shaper		26	87	1	3	1	3	0	0	2	7	1	3	4	13	20	67	5	17
168	172	use dial bar gages	X	8	27	3	10	0	0	11	37	8	27	15	50	9	30	3	10	3	10
8	12	setup Seike 3NE		28	93	1	3	0	0	0	0	1	3	0	0	1	3	22	73	7	23
9	13	setup Seike 4NE		27	90	0	0	0	0	0	0	3	10	2	7	1	3	20	67	7	23
10	14	setup Seike 4NEA		27	90	2	7	0	0	1	3	0	0	0	0	1	3	22	73	7	23
15	19	setup Landis external		19	63	1	3	1	3	6	20	3	10	6	20	8	27	11	37	5	17
16	20	setup Gardner disk		24	80	1	3	1	3	2	7	2	7	2	7	3	10	19	63	6	20
18	22	setup Landis plunge		27	90	0	0	2	7	1	3	0	0	1	3	5	17	18	60	6	20
19	23	setup Heald 271		24	80	1	3	2	7	2	7	1	3	2	7	3	10	19	63	6	20
20	24	setup Heald 272plain		25	83	0	0	1	3	2	7	2	7	1	3	3	10	20	67	6	20
21	25	setup Heald 272sizema		27	90	0	0	0	0	2	7	1	3	1	3	3	10	20	67	6	20

ROSTER C SECTIONS 5 & 6
SKILLED MACHINE

QUESTION # PT 1	QUESTION # PT 2	task	5 GEN'L KNLGE NEVER f	%	6 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
22	26	setup Cincinnati 181	27	90	0	0	0	0	2	7	1	3	2	7	3	10	19	63	6	20
23	27	setup external stepma	28	93	0	0	1	3	0	0	1	3	0	0	2	7	22	73	6	20
24	28	setup standard Heald	29	97	0	0	1	3	0	0	0	0	0	0	2	7	21	70	3	23
27	31	setup transfer machin	28	93	0	0	0	0	1	3	1	3	0	0	1	3	22	73	7	23
30	34	setup 4-6 spindle	24	80	0	0	1	3	0	0	15	17	5	17	5	17	14	47	6	20
31	35	setup hvy duty vertic	16	53	5	17	1	3	0	0	8	27	8	27	6	20	12	40	4	13
32	36	setupradial drill	16	53	2	7	3	10	3	10	6	20	11	37	5	17	10	33	4	13
33	37	setup NATCO	26	87	1	3	1	3	0	0	2	7	3	10	5	17	16	53	6	20
34	38	setup 21'upright	12	40	0	0	1	3	8	27	9	30	13	43	6	20	6	20	5	17
35	39	setup CNC vertical	25	83	0	0	3	10	1	3	1	3	2	7	0	0	21	70	7	23
36	40	setup CNC horizontal	28	93	0	0	1	3	0	0	1	3	0	0	1	3	21	70	8	27
37	41	setup Bridgeport hori	24	40	0	0	2	7	6	20	10	33	18	60	4	13	3	10	5	17
38	42	setup CincinRise&Fall	25	83	0	0	1	3	0	0	4	13	2	7	4	13	18	60	6	20
39	43	setup duplex twinhead	24	80	2	7	0	0	0	0	4	13	3	10	7	23	15	50	5	17
40	44	setup Milwaukee	25	83	1	3	1	3	0	0	3	10	4	13	2	7	18	60	6	20
41	45	setup J&L CNC chucker	26	87	2	7	0	0	1	3	1	3	1	3	1	3	20	67	8	27
42	46	setup J&L CNC combi	28	93	1	3	1	3	0	0	0	0	0	0	2	7	20	67	8	27
43	47	setup K&T 180	29	97	0	0	1	3	0	0	0	0	0	0	2	7	19	63	9	30
50	54	setup horiz broaches	28	93	0	0	0	0	0	0	2	7	2	7	4	13	17	57	7	23
53	57	setup engine lathe	8	27	2	7	0	0	11	37	9	30	18	60	4	13	4	13	4	13
57	61	setup TBI lathe	28	93	1	3	0	0	0	0	0	0	2	7	0	0	22	73	6	20
58	62	setup gun drill	27	90	0	0	1	3	0	0	1	3	2	7	5	17	17	57	6	20
59	63	oper.stand end plate	26	87	1	3	0	0	0	0	2	7	3	10	4	13	17	57	6	20
62	66	oper Seiki 3NE	26	87	0	0	0	0	1	3	2	7	0	0	4	13	18	60	8	27
63	67	oper.Seiki 4NE	24	80	1	3	1	3	0	0	3	10	2	7	3	10	17	57	8	27
64	68	oper.Seiki 4NEA	26	87	2	7	0	0	0	0	1	3	0	0	4	13	18	60	8	27
71	75	oper Hobb machine	18	60	1	3	2	7	6	20	3	10	8	27	2	7	13	43	7	23
80	84	oper.Jig Bore	14	47	1	3	0	0	5	17	10	33	13	43	5	17	5	17	7	23
82	86	oper bench grinders	10	33	0	0	1	3	15	50	4	13	17	57	2	7	8	27	3	10
83	87	oper. contour saw	15	50	1	3	0	0	8	27	6	20	13	43	3	10	9	30	5	17
84	88	oper. cam grinder	18	60	2	7	2	7	0	0	8	27	7	23	3	10	13	43	7	23
85	89	oper. Landis external	18	60	1	3	1	3	4	13	6	20	8	27	6	20	9	30	7	23
86	90	oper Norton external	20	67	1	3	0	0	2	7	7	23	9	30	6	20	8	27	7	23
87	91	oper. Gardner disk	25	83	0	0	0	0	2	7	3	10	4	13	2	7	16	53	8	27
88	92	oper Cincinn thru fee	28	93	0	0	0	0	2	7	0	0	2	7	4	13	16	53	8	27
89	93	oper.Landis plunge	27	90	0	0	0	0	2	7	1	3	3	10	3	10	16	53	8	27
90	94	oper.Heald 271	25	83	1	3	0	0	3	10	1	3	3	10	4	13	15	50	8	27
91	95	oper.Heald 272 plain	26	87	0	0	1	3	3	10	0	0	2	7	4	13	16	53	8	27
92	96	oper.Heald 272sizemat	28	93	0	0	0	0	2	7	0	0	2	7	3	10	17	57	8	27
93	97	oper. Cincin181	27	90	0	0	0	0	3	10	0	0	2	7	4	13	6	53	8	27
94	98	oper.external stepmas	28	93	0	0	0	0	1	3	1	3	1	3	1	3	20	67	8	27
95	99	oper.roll stamp	21	70	1	3	0	0	1	3	7	23	7	23	6	20	14	47	3	10
96	100	oper.power press	15	50	0	0	2	7	3	10	10	33	9	30	6	20	10	33	5	17
97	101	oper.standard Heald	28	93	0	0	1	3	0	0	1	3	0	0	3	10	19	63	8	27
99	103	oper.transfer machine	28	93	0	0	1	3	0	0	1	3	0	0	3	10	21	70	6	20
100	104	oper.Jones&Lamson ATL	27	90	0	0	0	0	1	3	2	7	0	0	5	17	19	63	6	20
101	105	oper.Wheel & Brader	25	83	1	3	1	3	0	0	3	10	2	7	6	20	15	50	7	23

ROSTER C SECTIONS 5 & 6
SKILLED MACHINE

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	5 NEVER f	%	6 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
102	106	oper.straightn press		14	47	6	20	3	10	2	7	5	17	12	40	2	7	11	37	5	17
103	107	oper. lapping machine		17	57	4	13	3	10	2	7	4	13	11	37	2	7	12	40	5	17
104	108	oper heat treat furna		28	93	0	0	0	0	1	3	0	0	1	3	2	7	18	60	9	30
105	109	oper.induction heat		26	87	0	0	0	0	1	3	2	7	1	3	4	13	16	53	9	30
106	110	oper.4-6spindle		23	77	0	0	1	3	0	0	6	20	7	23	3	10	14	47	6	20
107	111	oper.radial drill		16	53	1	3	2	7	4	13	7	23	12	40	4	13	10	33	4	13
108	112	oper.NATCO multi		25	83	1	3	0	0	0	0	4	13	5	17	5	17	14	47	6	20
109	113	oper.24'upright singl		14	47	1	3	1	3	5	17	9	30	13	43	3	10	8	27	6	20
110	114	oper.OKATA CNC		29	97	1	3	0	0	0	0	0	0	0	0	4	13	18	60	8	27
114	118	oper.Bridgeport verti		8	27	1	3	0	0	12	40	9	30	20	67	3	10	3	10	4	13
115	119	oper Cincin Rise&Fall		26	87	0	0	1	3	0	0	3	10	4	13	6	20	14	47	6	20
116	120	oper.duplex-twin		24	80	1	3	1	3	0	0	4	13	4	13	7	23	13	43	5	17
117	121	oper Milwaukee		25	83	2	7	0	0	0	0	3	10	3	10	3	10	18	60	6	20
118	122	oper. J&L CNC chucker		27	90	1	3	1	3	1	3	0	0	1	3	3	10	17	57	9	30
119	123	oper.J&L CNC combi		28	93	1	3	0	0	1	3	0	0	0	0	2	7	19	63	9	30
120	124	oper Shaffner		28	93	0	0	1	3	0	0	1	3	1	3	5	17	17	57	7	23
121	125	oper. oper K&T 180		29	97	0	0	0	0	1	3	0	0	0	0	3	10	19	63	18	27
124	128	oper.Marvel saw		26	87	0	0	0	0	1	3	3	10	6	20	9	30	9	30	6	20
131	135	oper. Vibro machine		29	97	0	0	1	3	0	0	0	0	0	0	9	30	14	47	6	20
135	139	oper.barrel machine		29	97	1	3	0	0	0	0	0	0	1	3	7	23	17	57	5	17
136	140	oper.big wash		29	97	1	3	0	0	0	0	0	0	2	7	5	17	18	60	5	17
137	141	oper.derust wash		28	93	1	3	1	3	0	0	0	0	2	7	6	20	17	57	5	17
138	142	oper.paint booth		25	83	1	3	0	0	1	3	3	10	3	10	8	27	14	47	5	17
139	143	oper.powder coating		29	97	0	0	1	3	0	0	0	0	0	0	8	27	16	53	6	20
140	144	oper.spin finish		28	93	1	3	0	0	0	0	1	3	1	3	5	17	17	57	7	23
141	145	oper.buffing lathe		27	90	0	0	1	3	1	3	1	3	2	7	7	23	15	50	6	20
142	146	oper. disc sander		19	63	1	3	2	7	0	0	8	27	9	30	6	20	9	30	6	20
143	147	oper.float sander		26	87	0	0	0	0	1	3	3	10	3	10	9	30	11	37	7	23
144	148	oper.belt sandner		9	30	1	3	1	3	12	40	7	23	18	60	4	13	4	13	4	13
151	155	read Height&flatness	X	5	17	1	3	2	7	18	60	4	13	25	83	1	3	1	3	3	10
153	157	maintain crib service	X	11	37	1	3	1	3	5	17	12	40	22	73	2	7	3	10	3	10
154	158	maintain tool invento	X	12	40	3	10	2	7	5	17	8	27	20	67	4	13	4	13	2	7
163	167	asasemble components	X	8	27	0	0	1	3	16	53	5	17	19	63	6	20	2	7	3	10
164	168	oper.robot cell		26	87	0	0	1	3	1	3	1	3	4	13	8	27	14	47	4	13
165	169	stamp ID on part		6	20	3	10	2	7	13	43	5	17	20	67	5	17	3	10	2	7
167	171	assemble 2 or more pa		5	17	2	7	3	10	13	43	7	23	22	73	3	10	1	3	3	10
170	174	oper. furnace		29	97	0	0	0	0	1	3	0	0	1	3	4	13	18	60	7	23
171	175	use Rockwell hardness		21	70	1	3	1	3	0	0	7	23	4	13	10	33	10	33	6	20
172	176	oper. black oxide		29	97	0	0	1	3	0	0	0	0	1	3	6	20	16	53	7	23
173	177	oper forge furnace		29	97	0	0	0	0	1	3	0	0	1	3	3	10	19	63	7	23
175	179	oper.upset hammer		27	90	1	3	0	0	1	3	1	3	1	3	7	23	16	53	6	20
176	180	oper. Richard's bende		29	97	0	0	0	0	1	3	0	0	3	10	6	20	16	53	5	17
177	181	sharpen drills	X	6	20	1	3	2	7	13	43	8	27	22	73	2	7	2	7	4	13
191	196	assist w/repair		9	30	5	17	2	7	8	27	6	20	22	73	3	10	3	10	2	7
192	197	assist w/troubleshoot		5	17	2	7	0	0	19	63	4	13	26	87	1	3	2	7	1	3

ROSTER D   SECTIONS 7 & 8
SKILLED TRADES
QUESTION #

PT 1	PT 2	task	GEN'L KNLGE	7 NEVER		8 >1/MO		3 MONTHLY		4 REGULARLY		5 IN PAST		1 CAN DO		2 W/HELP		3 SIMILAR		4 NEED TR'NG	
				f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
146	150	read micrometers	X	4	15	3	12	3	12	14	54	1	4	19	73	2	8	1	4	3	12
152	156	use basic math	X	1	4	2	8	0	0	20	77	2	8	22	85	3	12	1	4	0	0
145	149	read blueprints	X	0	0	3	12	1	4	14	54	3	12	18	69	2	8	2	8	3	12
185	190	arrange for service		14	54	3	12	0	0	9	35	0	0	19	73	1	4	2	8	4	15
180	184	load/unload machine		13	50	1	4	0	0	11	42	1	4	16	62	5	19	1	4	4	15
190	195	assist in troubleshoo		6	23	0	0	0	0	19	73	1	4	20	77	3	12	1	4	1	4
186	191	check part to print		10	38	3	12	0	0	9	31	4	15	16	62	3	12	3	12	4	15
155	159	use Vernier calipers	X	5	19	4	15	3	12	11	42	2	8	19	73	3	12	1	4	3	12
169	173	use depth gages	X	14	54	4	15	0	0	6	23	1	4	14	54	5	19	3	12	4	15
166	170	read WIP forms	X	18	69	0	0	0	0	3	12	4	15	7	27	8	31	6	23	5	19
181	186	obtain tooling		8	31	2	8	0	0	15	58	1	4	19	73	4	15	2	8	1	4
188	193	mount material		10	38	3	12	1	4	8	31	2	8	17	65	4	15	2	8	3	12
189	194	change fixture		11	42	4	15	0	0	8	31	2	8	15	58	4	15	4	15	3	12
158	162	use trigonometry	X	10	38	5	19	2	8	7	27	2	8	12	46	5	19	3	12	6	23
178	182	read Machinist handbk	X	13	50	3	12	1	4	6	23	2	8	16	62	4	15	2	8	4	15
156	160	use Johannson blocks	X	11	42	6	23	1	4	6	23	1	4	17	65	4	15	2	8	3	12
157	161	use Machinist handbk	X	16	62	2	8	1	4	7	27	0	0	18	69	2	8	3	12	3	12
159	163	read complicated draw	X	5	19	1	4	2	8	16	62	2	8	17	65	5	19	1	4	3	12
160	164	use depth gage	X	8	31	4	15	1	4	10	38	1	4	18	69	2	8	3	12	3	12
161	165	use shadow gage	X	13	50	5	19	1	4	4	15	2	8	17	65	3	12	3	12	3	12
162	166	use radius gage	X	13	50	4	15	0	0	7	27	1	4	16	62	4	15	3	12	3	12
149	153	measure to .0001"	X	6	23	5	19	2	8	12	46	1	4	19	73	3	12	1	4	3	12
183	188	assist w/ maintenance	X	9	35	0	0	1	4	15	58	1	4	21	81	3	12	2	8	0	0
150	154	measure to 1/64"	X	5	19	3	12	1	4	15	58	2	8	21	81	2	8	1	4	2	8
179	183	adjust machine		12	46	0	0	0	0	13	50	1	4	15	58	6	23	2	8	3	12
182	187	clean,oil,lubricate		9	35	0	0	0	0	14	54	3	12	22	85	2	8	1	4	1	4
78	82	oper.milling machines		14	54	3	12	1	4	6	23	2	8	6	23	3	12	13	50	4	15
111	115	oper.Bridgeport CNCmi		19	73	3	12	0	0	0	0	4	15	0	0	3	12	15	58	8	31
112	116	oper.Cincinnati horiz		14	54	3	12	0	0	4	15	5	19	5	19	3	12	13	50	5	19
113	117	oper.Cincinnati verti		15	58	3	12	0	0	4	15	4	15	5	19	3	12	13	50	5	19
70	74	oper.surface grinder		14	54	3	12	2	8	5	19	2	8	5	19	5	19	11	42	5	19
12	16	setup drill press		12	46	1	4	1	4	8	31	4	15	7	27	3	12	11	42	4	15
17	21	setup Cin thru feed		26	100	0	0	0	0	0	0	0	0	0	0	4	15	13	50	9	35
60	64	oper.drill press		6	23	0	0	4	15	11	42	4	15	12	46	3	12	8	31	3	12
147	151	read concentricity ga	X	11	42	4	15	1	4	8	31	1	4	15	58	6	23	2	8	3	12
184	189	load tape in NC		14	54	3	12	5	19	3	12	1	4	9	35	9	35	4	15	4	15
187	192	program machine		12	46	4	15	1	4	5	19	2	8	9	35	6	23	7	27	3	12
79	83	oper.lathe		13	50	3	12	1	4	6	23	3	12	10	38	1	4	11	42	4	15
13	17	setup Bridgeport mill		17	65	1	4	0	0	6	23	2	8	5	19	5	19	12	47	4	15
51	55	setup MSO		25	96	1	4	0	0	0	0	0	0	0	0	2	8	16	62	8	31
61	65	oper. Bridgeport mill		12	46	3	12	2	8	5	19	4	15	7	27	2	8	12	46	5	19
66	70	oper.Cinnati Monosett		18	69	2	8	2	8	1	4	3	12	3	12	4	15	14	54	5	19
67	71	oper.Heald tool grind		19	73	2	8	2	8	1	4	2	8	2	8	6	23	13	50	5	19
68	72	oper. Norton surface		15	58	3	12	2	8	2	8	4	15	3	12	6	23	12	46	5	19
69	73	oper.drill grinder		15	58	3	12	2	8	1	4	5	19	4	15	5	19	12	46	5	19
72	76	oper.cutter & tool		16	62	2	8	1	4	1	4	6	23	4	15	4	15	13	50	5	19
73	77	oper.tap grind		19	73	1	4	1	4	1	4	4	15	2	8	5	19	14	54	5	19

File: MASTER C

ROSTER D SECTIONS 7 & 8
SKILLED TRADES

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	7 NEVER f	%	8 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
74	78	oper.thread chaser		16	62	3	12	1	4	2	8	4	15	2	8	6	23	13	50	5	19
75	79	oper.Gleason cutter		19	73	1	4	1	4	1	4	4	15	1	4	3	12	14	54	8	31
129	133	oper. MSO machine		21	81	3	12	0	0	0	0	2	8	1	4	5	19	13	50	7	27
148	152	read plug gages	X	10	38	8	31	0	0	7	27	1	4	18	69	4	15	1	4	3	12
14	18	setup Sunnen		23	88	2	8	0	0	0	0	1	4	1	4	4	15	13	50	8	31
28	32	setup Potter&Johnson		23	88	1	4	0	0	0	0	2	8	0	0	4	15	13	50	9	35
44	48	setup Scimmx		26	100	0	0	0	0	0	0	0	0	0	0	0	0	16	62	10	38
65	69	oper.Sunnen horiz		19	73	2	8	2	8	0	0	3	12	4	15	2	8	14	54	6	23
76	80	oper.single point car		19	73	0	0	2	8	1	4	4	15	2	8	4	15	14	54	5	19
81	85	oper.surface grinder		16	62	2	8	1	4	5	19	2	8	6	23	4	15	11	42	4	15
122	126	oper. Scimmx		23	88	2	8	0	0	0	0	1	4	0	0	2	8	13	50	10	38
174	178	use slip gages	X	23	88	1	4	0	0	0	0	1	4	5	19	5	19	12	46	4	15
11	15	setup Standard endpla		23	88	0	0	0	0	0	0	3	12	0	0	5	19	12	46	9	35
25	29	setup Standard Heald		26	100	0	0	0	0	0	0	0	0	0	0	2	8	13	50	10	38
26	30	setup Horizontal turr		23	88	1	4	0	0	0	0	2	8	1	4	3	12	13	50	8	31
29	33	setup Warner SwazyAC		23	88	1	4	0	0	0	0	1	4	1	4	3	12	13	50	9	35
45	49	setup DoAll saw		15	58	2	8	1	4	4	15	4	15	8	31	2	8	11	42	5	19
46	50	setup Wagner saw		22	85	1	4	0	0	1	4	2	8	2	8	5	19	13	50	6	23
47	51	setup Barber-Coleman		24	92	1	4	0	0	0	0	1	4	0	0	2	8	15	58	9	35
48	52	setup Anvill Mill		23	88	1	4	1	4	0	0	1	4	1	4	1	4	16	62	8	31
49	53	setup vertical broach		23	88	1	4	1	4	0	0	1	4	0	0	3	12	17	65	6	23
52	56	setup Burke twin mill		26	100	0	0	0	0	0	0	0	0	0	0	2	8	13	50	11	42
54	58	setup multiple spindl		25	96	0	0	0	0	0	0	1	4	0	0	3	12	16	62	7	27
55	59	setup automatic screw		24	92	1	4	0	0	0	0	0	0	0	0	3	12	16	62	7	27
56	60	setup gear shaper		25	96	0	0	0	0	0	0	1	4	0	0	3	12	15	58	8	31
77	81	oper.Sunnen precision		16	62	3	12	1	4	1	4	5	19	5	19	5	19	10	38	6	23
98	102	oper.Heald borematic		22	85	2	8	0	0	1	4	1	4	0	0	3	12	15	58	7	27
123	127	oper.DoAll Saw		9	35	6	23	0	0	6	23	5	19	10	38	6	23	7	27	3	12
125	129	oper.Wagner saw		16	62	3	12	0	0	1	4	5	19	2	8	7	27	13	50	4	15
126	130	oper. BarberColeman		21	81	2	8	0	0	0	0	3	12	0	0	4	15	15	58	7	27
127	131	oper.Anvill Mill		20	77	4	15	0	0	0	0	2	8	1	4	2	8	16	62	7	27
128	132	oper.vertical broache		20	77	3	12	0	0	0	0	3	12	1	4	3	12	17	65	5	19
130	134	oper.Burke twin mill		22	85	3	12	0	0	0	0	1	4	1	4	4	15	13	50	8	31
132	136	oper.multiple spindle		22	85	3	12	0	0	0	0	1	4	1	4	3	12	14	54	8	31
133	137	oper.automatic screw		21	81	2	8	0	0	0	0	3	12	1	4	4	15	14	54	7	27
134	138	oper.gear shaper		20	77	2	8	0	0	0	0	4	15	1	4	4	15	14	54	7	27
168	172	use dial bar gages	X	15	58	4	15	0	0	4	15	2	8	12	46	7	27	3	12	4	15
8	12	setup Seike 3NE		25	96	0	0	0	0	0	0	1	4	0	0	4	15	13	50	6	23
9	13	setup Seike 4NE		24	92	0	0	0	0	1	4	1	4	0	0	4	15	13	50	6	23
10	14	setup Seike 4NEA		24	92	0	0	0	0	0	0	2	8	0	0	5	19	13	50	8	31
15	19	setup Landis external		23	88	1	4	0	0	1	4	1	4	3	12	4	15	12	46	7	27
16	20	setup Gardner disk		24	92	1	4	0	0	1	4	0	0	0	0	3	12	13	50	9	35
18	22	setup Landis plunge		24	92	1	4	0	0	0	0	1	4	0	0	3	12	14	54	9	35
19	23	setup Heald 271		24	92	1	4	0	0	0	0	1	4	0	0	4	15	12	46	10	38
20	24	setup Heald 272plain		24	92	1	4	0	0	0	0	1	4	0	0	4	15	13	50	9	35
21	25	setup Heald 272sizema		24	92	1	4	0	0	0	0	1	4	0	0	4	15	13	50	9	35
22	26	setup Cincinnati 181		24	92	1	4	0	0	0	0	1	4	0	0	4	15	14	54	8	31

ROSTER D SECTIONS 7 & 8
SKILLED TRADES

QUESTION # PT 1	PT 2	task	7 GEN'L KNLGE NEVER f	%	8 >1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
23	27	setup external stepma	25	96	1	4	0	0	0	0	0	0	0	0	3	12	14	54	9	35
24	28	setup standard Heald	25	96	1	4	0	0	0	0	0	0	0	0	3	12	12	46	10	38
27	31	setup transfer machin	24	92	1	4	0	0	0	0	1	4	0	0	4	15	13	50	9	35
30	34	setup 4-6 spindle	22	85	1	4	0	0	0	0	3	12	1	4	2	8	15	58	8	31
31	35	setup hvy duty vertic	22	85	1	4	0	0	0	0	3	12	2	8	2	8	16	62	6	23
32	36	setupradial drill	22	85	1	4	0	0	1	4	2	8	2	8	5	19	14	54	5	19
33	37	setup NATCO	22	85	1	4	0	0	0	0	2	8	1	4	3	12	16	62	6	23
34	38	setup 21'upright	22	85	1	4	0	0	1	4	2	8	3	12	3	12	14	54	6	23
35	39	setup CNC vertical	24	92	0	0	0	0	0	0	2	8	0	0	3	12	13	50	10	38
36	40	setup CNC horizontal	24	92	0	0	0	0	1	4	1	4	0	0	3	12	13	50	10	38
37	41	setup Bridgeport hori	20	77	2	8	0	0	0	0	4	15	5	19	2	8	13	50	6	23
38	42	setup CincinRise&Fall	25	96	0	0	0	0	1	4	0	0	1	4	2	8	15	58	8	31
39	43	setup duplex twinhead	25	96	0	0	0	0	0	0	1	4	0	0	1	4	17	65	8	31
40	44	setup Milwaukee	24	92	1	4	0	0	0	0	1	4	0	0	0	0	17	65	9	35
41	45	setup J&L CNC chucker	24	92	1	4	0	0	0	0	1	4	0	0	1	4	16	62	9	35
42	46	setup J&L CNC combi	25	96	0	0	0	0	0	0	1	4	0	0	0	0	17	65	9	35
43	47	setup K&T 180	26	100	0	0	0	0	0	0	0	0	0	0	0	0	16	62	10	38
50	54	setup horiz broaches	23	88	1	4	1	4	0	0	1	4	0	0	3	12	17	65	6	23
53	57	setup engine lathe	19	73	1	4	0	0	3	12	3	12	7	27	1	4	11	42	7	27
57	61	setup TBI lathe	26	100	0	0	0	0	0	0	0	0	0	0	2	8	15	58	9	35
58	62	setup gun drill	25	96	0	0	0	0	0	0	1	4	0	0	2	8	17	65	7	27
59	63	oper.stand end plate	20	77	1	4	0	0	0	0	3	12	1	4	1	4	18	69	5	19
62	66	oper Seiki 3NE	20	77	2	8	2	8	0	0	2	8	0	0	2	8	16	62	8	31
63	67	oper.Seiki 4NE	20	77	2	8	2	8	0	0	2	8	0	0	2	8	16	62	8	31
64	68	oper.Seiki 4NEA	19	73	2	8	2	8	0	0	3	12	0	0	2	8	16	62	8	31
71	75	oper Hobb machine	19	73	2	8	1	4	1	4	3	12	3	12	3	12	14	54	6	23
80	84	oper.Jig Bore	19	73	1	4	1	4	3	12	1	4	4	15	2	8	16	62	4	15
82	86	oper bench grinders	9	35	1	4	2	8	9	35	5	19	8	31	3	12	11	42	4	15
83	87	oper. contour saw	17	65	2	8	1	4	3	12	3	12	4	15	4	15	13	50	5	19
84	88	oper. cam grinder	23	88	0	0	1	4	0	0	2	8	0	0	6	23	15	58	5	19
85	89	oper. Landis external	20	77	2	8	1	4	1	4	2	8	3	12	3	12	14	54	6	23
86	90	oper Norton external	19	73	2	8	1	4	1	4	3	12	4	15	3	12	14	54	5	19
87	91	oper. Gardner disk	22	85	1	4	1	4	1	4	1	4	1	4	4	15	14	54	7	27
88	92	oper Cincinn thru fee	23	88	1	4	1	4	0	0	1	4	1	4	3	12	15	58	7	27
89	93	oper.Landis plunge	23	88	1	4	1	4	0	0	1	4	1	4	3	12	15	58	7	27
90	94	oper.Heald 271	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31
91	95	oper.Heald 272 plain	21	81	2	8	1	4	0	0	2	8	1	4	4	15	14	54	7	27
92	96	oper.Heald 272sizemat	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31
93	97	oper. Cincin181	21	81	2	8	1	4	0	0	2	8	1	4	4	15	13	50	8	31
94	98	oper.external stepmas	22	85	2	8	1	4	0	0	1	4	0	0	3	12	16	62	7	27
95	99	oper.roll stamp	18	69	3	12	1	4	0	0	4	15	3	12	6	23	12	46	5	19
96	100	oper.power press	15	58	2	8	1	4	2	8	6	23	6	23	5	19	11	42	4	15
97	101	oper.standard Heald	21	81	2	8	0	0	1	4	2	8	0	0	3	12	15	58	8	31
99	103	oper.transfer machine	21	81	2	8	0	0	0	0	3	12	0	0	2	8	15	58	9	35
100	104	oper.Jones&Lamson ATL	19	73	2	8	1	4	0	0	4	15	2	8	2	8	15	58	7	27
101	105	oper.Wheel & Brader	19	73	2	8	1	4	0	0	4	15	3	12	2	8	16	62	5	19
102	106	oper.straightn press	14	54	3	12	2	8	2	8	5	19	6	23	3	12	12	46	5	19

ROSTER D SECTIONS 7 & 8
SKILLED TRADES

QUESTION #				7		8		3		4		5		1		2		3		4	
			GEN'L KNLGE	NEVER		>1/MO		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED TR'NG	
PT 1	PT 2	task		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
103	107	cper. lapping machine		18	69	3	12	0	0	1	4	4	15	3	12	4	15	12	46	6	23
104	108	oper heat treat furna		23	68	1	4	0	0	0	0	2	8	0	0	4	15	14	54	8	31
105	109	oper.induction heat		21	81	0	0	1	4	0	0	4	15	0	0	2	8	16	62	7	27
106	110	oper.4-6spindle		21	81	1	4	0	0	0	0	4	15	2	8	1	4	17	65	6	23
107	111	cper.radial drill		17	65	3	12	0	0	2	8	4	15	5	19	4	15	12	46	5	19
108	112	oper.NATCO multi		20	77	2	8	0	0	0	0	4	15	4	15	2	8	13	50	6	23
109	113	cper.24'upright singl		13	50	3	12	2	8	3	12	5	19	5	19	3	12	13	50	5	19
110	114	oper.OKATA CNC		20	77	3	12	0	0	0	0	3	12	0	0	3	12	15	58	8	31
114	118	oper.Bridgeport verti		14	54	4	15	0	0	5	19	3	12	5	19	4	15	12	46	5	19
115	119	oper Cincin Rise&Fall		19	73	3	12	0	0	1	4	3	12	1	4	3	12	15	58	7	27
116	120	oper.duplex-twin		21	81	3	12	0	0	0	0	2	8	0	0	3	12	13	50	8	31
117	121	oper Milwaukee		20	77	3	12	0	0	0	0	3	12	0	0	3	12	13	50	10	38
118	122	oper. J&L CNC chucker		20	77	3	12	0	0	0	0	3	12	0	0	3	12	14	54	8	31
119	123	oper.J&L CNC combi		21	81	3	12	0	0	0	0	2	8	0	0	2	8	14	54	9	35
120	124	oper Shaffner		21	81	3	12	0	0	0	0	2	8	0	0	3	12	13	50	9	35
121	125	oper. oper K&T 180		21	81	3	12	0	0	0	0	2	8	0	0	2	8	13	50	10	38
124	128	oper.Marvel saw		17	65	4	15	0	0	1	4	2	12	2	8	7	27	13	50	4	15
131	135	oper. Vibro machine		18	69	4	15	0	0	0	0	4	15	2	8	7	27	11	42	6	23
135	139	cper.barrel machine		21	81	1	4	0	0	0	0	4	15	1	4	4	15	16	62	5	19
136	140	oper.big wash		20	77	1	4	0	0	0	0	5	19	2	8	4	15	15	58	5	19
137	141	oper.derust wash		19	73	2	8	0	0	0	0	5	19	2	8	4	15	16	62	4	15
138	142	oper.paint booth		18	69	3	13	0	0	0	0	5	19	3	12	3	12	15	58	5	19
139	143	oper.powder coating		21	81	2	8	0	0	0	0	3	12	1	4	5	19	14	54	6	23
140	144	oper.spin finish		18	69	2	8	0	0	0	0	5	19	1	4	5	19	15	58	5	19
141	145	oper.buffing lathe		21	81	1	4	0	0	0	0	4	15	2	8	7	27	12	46	5	19
142	146	oper. disc sander		14	54	4	15	0	0	1	4	7	27	7	27	3	12	12	46	4	15
143	147	oper.float sander		18	69	3	12	0	0	0	0	5	19	4	15	4	15	13	50	4	15
144	148	oper.belt sandner		8	31	4	15	1	4	6	23	7	27	10	38	4	15	9	35	3	12
151	155	read Height&flatness	X	11	42	5	19	0	0	8	31	1	4	17	65	4	15	2	8	3	12
153	157	maintain crib service	X	12	46	5	19	0	0	5	19	3	12	15	58	6	23	2	8	3	13
154	158	maintain tool invento	X	7	27	4	15	0	0	11	42	2	8	19	73	4	15	1	4	2	8
163	167	asasemble components	X	15	58	0	0	1	4	7	27	2	8	18	69	6	23	0	0	2	8
164	168	oper.robot cell		21	81	1	4	1	4	2	8	1	4	9	35	7	27	6	23	4	15
165	169	stamp ID on part		14	54	0	0	0	0	7	27	5	19	21	81	2	8	0	0	3	12
167	171	assemble 2 or more pa		5	19	0	0	1	4	16	62	4	15	21	81	1	4	1	4	3	12
170	174	oper. furnace		19	73	1	4	0	0	1	4	4	15	2	8	6	23	11	42	7	27
171	175	use Rockwell hardness		16	62	3	12	0	0	2	8	4	15	2	8	11	42	7	27	6	23
172	176	oper. black oxide		23	88	0	0	0	0	0	0	2	8	2	8	4	15	14	54	6	23
173	177	oper forge furnace		24	92	0	0	0	0	0	0	2	8	1	4	6	23	13	50	6	23
175	179	oper.upset hammer		24	92	0	0	0	0	0	0	1	4	1	4	4	15	15	58	6	23
176	180	oper. Richard's bende		21	81	2	8	0	0	0	0	2	8	1	4	4	15	15	58	6	23
177	181	sharpen drills	X	5	19	3	12	6	23	7	27	4	15	15	58	6	23	1	4	4	15
191	196	assist w/repair		4	15	1	4	0	0	19	73	2	8	21	81	3	12	1	4	1	4
192	196	assist w/troubleshoot		4	15	0	0	1	4	20	77	1	4	20	77	4	15	1	4	1	4

ROSTER E SECTIONS ALL
SUMMARY

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	NEVER f	%	>1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
146	150	read micrometers	X	42	14%	15	5%	13	4%	192	62%	46	15%	231	75%	24	8%	22	7%	30	10%
152	156	use basic math	X	44	14%	13	4%	3	1%	212	69%	35	11%	248	81%	24	8%	17	6%	18	6%
145	149	read blueprints	X	32	12%	13	5%	8	3%	177	64%	48	17%	206	68%	42	14%	28	9%	29	10%
185	190	arrange for service		147	48%	18	6%	1	0%	103	33%	39	13%	159	53%	51	17%	43	14%	47	16%
180	184	load/unload machine		86	28%	2	1%	1	0%	173	56%	45	15%	213	70%	25	8%	26	9%	40	13%
190	195	assist in troubleshoo		79	26%	13	4%	9	3%	166	54%	40	13%	202	67%	41	14%	28	9%	32	11%
186	191	check part to print	X	68	22%	19	6%	6	2%	175	55%	48	15%	222	73%	28	9%	23	8%	33	11%
155	159	use Vernier calipers	X	73	24%	16	5%	14	5%	166	54%	39	13%	219	71%	24	8%	25	8%	39	13%
169	173	use depth gages	X	119	39%	17	6%	7	2%	106	35%	54	18%	169	56%	37	12%	40	13%	57	19%
166	170	read WIP forms	X	138	45%	15	5%	3	1%	114	37%	39	13%	66	30%	48	22%	50	22%	59	26%
181	186	obtain tooling		72	23%	8	3%	4	1%	181	59%	47	15%	228	73%	37	12%	22	7%	18	6%
188	193	mount material		103	33%	14	4%	6	2%	146	46%	45	14%	189	62%	31	10%	33	11%	51	17%
189	194	change fixture		111	33%	32	10%	5	2%	130	39%	54	16%	181	60%	27	9%	40	13%	56	18%
158	162	use trigonometry	X	241	78%	18	6%	7	2%	25	8%	18	6%	44	14%	33	11%	49	16%	180	59%
178	182	read Machinist handbk	X	130	42%	44	14%	13	4%	54	17%	68	22%	190	63%	35	12%	28	9%	49	16%
156	160	use Johannson blocks	X	123	40%	21	7%	6	2%	131	43%	27	9%	185	61%	33	11%	30	10%	56	18%
157	161	use Machinist handbk	X	145	47%	41	13%	8	3%	74	24%	43	14%	174	57%	44	14%	34	11%	53	17%
159	163	read complicated dra	X	107	34%	23	7%	11	4%	125	40%	45	14%	127	41%	69	22%	43	14%	68	22%
160	164	use depth gage	X	70	23%	21	7%	9	3%	150	49%	54	18%	201	66%	36	12%	25	9%	41	13%
161	165	use shadow gage	X	138	45%	34	11%	5	2%	72	23%	59	19%	166	55%	47	15%	44	14%	47	15%
162	166	use radius gage	X	105	34%	23	7%	8	3%	124	40%	50	16%	193	63%	34	11%	36	12%	42	14%
149	153	measure to .0001"	X	67	22%	18	6%	11	4%	158	51%	53	17%	221	72%	24	8%	31	10%	32	10%
183	188	assist w/ maintenance	X	106	34%	14	4%	3	1%	143	46%	46	15%	193	64%	50	17%	32	11%	27	9%
150	154	measure to 1/64"	X	58	19%	9	3%	7	2%	181	59%	50	16%	227	74%	19	6%	29	9%	31	10%
179	183	adjust machine		89	29%	4	1%	0	0%	173	56%	44	14%	204	67%	28	9%	25	8%	46	15%
182	187	clean,oil,lubricate		74	24%	2	1%	4	1%	182	59%	49	16%	231	76%	33	11%	21	7%	20	7%
78	82	oper.milling machines		186	60%	8	3%	7	2%	41	13%	66	21%	64	21%	59	19%	89	29%	96	31%
111	115	oper.Bridgeport CNCmi		266	86%	6	2%	1	0%	6	2%	30	10%	21	7%	28	9%	118	38%	141	46%
112	116	oper.Cincinnati horiz		212	69%	5	2%	3	1%	28	9%	60	19%	59	19%	33	11%	95	31%	121	39%
113	117	oper.Cincinnati verti		222	72%	9	3%	5	2%	19	6%	53	17%	57	19%	32	10%	100	32%	119	39%
70	74	oper.surface grinder		227	73%	11	4%	5	2%	26	8%	41	13%	46	15%	34	11%	101	34%	117	39%
12	16	setup drill press		145	47%	13	4%	10	3%	38	12%	104	34%	98	32%	72	23%	81	26%	56	18%
17	21	setup Cin thru feed		287	92%	5	2%	2	1%	6	2%	11	4%	11	4%	21	7%	123	40%	153	50%
60	64	oper.drill press		123	40%	16	5%	10	3%	43	14%	117	38%	100	33%	73	24%	74	24%	59	19%
147	151	read concentricity ga	X	84	28%	17	6%	6	2%	156	51%	42	14%	196	64%	40	13%	29	9%	43	14%
184	189	load tape in NC		221	72%	10	3%	8	3%	35	11%	35	11%	65	22%	54	18%	76	25%	107	35%
187	192	program machine		211	69%	12	4%	3	1%	59	19%	21	7%	86	28%	36	12%	70	23%	110	36%
79	83	oper.lathe		173	56%	14	5%	6	2%	36	12%	82	26%	72	23%	51	17%	89	29%	96	31%
13	17	setup Bridgeport mill		195	63%	11	4%	5	2%	35	11%	65	21%	73	24%	48	16%	89	29%	96	31%
51	55	setup MSO		286	92%	3	1%	3	1%	3	1%	15	5%	18	6%	17	6%	116	38%	156	51%
61	65	oper. Bridgeport mill		178	57%	16	5%	9	3%	31	10%	76	25%	81	27%	46	15%	79	26%	93	31%
66	70	oper.Cinnati Monosett		265	88%	3	1%	5	2%	11	4%	16	5%	20	7%	26	9%	108	36%	147	49%
67	71	oper.Heald tool grind		276	99%	4	1%	4	1%	10	3%	16	5%	21	7%	27	9%	107	35%	153	50%
68	72	oper. Norton surface		242	79%	10	3%	5	2%	20	6%	32	10%	34	11%	38	12%	106	34%	130	42%
69	73	oper.drill grinder		243	79%	9	3%	6	2%	12	4%	39	13%	35	11%	48	16%	103	33%	122	40%
72	76	oper.cutter & tool		266	86%	8	3%	3	1%	9	3%	25	8%	23	7%	31	10%	108	35%	146	47%
73	77	oper.tap grind		277	90%	4	1%	3	1%	6	2%	18	6%	20	6%	26	8%	111	36%	151	49%

ROSTER E SECTIONS ALL
SUMMARY

QUESTION # PT 1	PT 2	task	GEN'L KNLGE	NEVER f	%	>1/MO f	%	3 MONTHLY f	%	4 REGULARLY f	%	5 IN PAST f	%	1 CAN DO f	%	2 W/HELP f	%	3 SIMILAR f	%	4 NEED TR'NG f	%
74	78	oper.thread chaser		253	82%	8	3%	3	1%	15	5%	30	10%	29	9%	39	13%	97	31%	143	46%
75	79	oper.Gleason cutter		281	91%	4	1%	3	1%	9	3%	13	4%	17	6%	23	7%	111	36%	157	51%
129	133	oper. MSO machine		268	86%	5	2%	4	1%	5	2%	28	9%	23	7%	26	8%	116	38%	142	46%
148	152	read plug gages	X	64	21%	20	7%	5	2%	162	53%	56	18%	215	71%	27	9%	27	9%	35	11%
14	18	setup Sunnen		257	83%	16	5%	5	2%	11	4%	20	6%	32	10%	40	13%	102	33%	131	43%
28	32	setup Potter&Johnson		258	83%	6	2%	1	0%	8	3%	37	12%	17	6%	28	9%	124	41%	136	45%
44	48	setup Scimmx		292	95%	3	1%	1	0%	5	2%	7	2%	7	2%	10	3%	114	37%	175	57%
65	69	oper.Sunnen horiz		255	83%	13	4%	7	2%	10	3%	24	8%	32	10%	37	12%	102	33%	135	44%
76	80	oper.single point car		274	88%	2	1%	4	1%	8	3%	22	7%	20	7%	28	9%	112	36%	147	48%
81	85	oper.surface grinder		224	72%	11	4%	4	1%	31	10%	41	13%	52	17%	41	13%	101	33%	111	36%
122	126	oper. Scimmx		288	94%	4	1%	1	0%	7	2%	6	2%	11	4%	19	6%	111	36%	164	54%
174	178	use slip gages	X	217	71%	13	4%	5	2%	41	13%	31	10%	73	24%	57	19%	88	29%	84	28%
11	15	setup Standard endpla		264	85%	6	2%	3	1%	4	1%	33	11%	17	6%	36	12%	113	38%	136	44%
25	29	setup Standard Heald		284	92%	4	1%	1	0%	6	2%	15	5%	11	4%	18	6%	112	37%	162	53%
26	30	setup Horizontal turr		225	73%	13	4%	4	1%	7	2%	60	19%	31	10%	38	13%	107	36%	124	41%
29	33	setup Warner SwazyAC		255	84%	9	3%	2	1%	6	2%	32	11%	23	7%	27	9%	117	38%	140	46%
45	49	setup DoAll saw		219	71%	13	4%	5	2%	29	9%	43	14%	52	17%	43	14%	101	33%	111	36%
46	50	setup Wagner saw		272	87%	5	2%	4	1%	10	3%	22	7%	21	7%	48	16%	117	38%	121	39%
47	51	setup Barber-Coleman		288	93%	5	2%	2	1%	4	1%	12	4%	12	4%	24	8%	113	37%	159	52%
48	52	setup Anvill Mill		270	87%	3	1%	3	1%	5	2%	29	9%	8	3%	33	11%	115	38%	149	49%
49	53	setup vertical broach		265	85%	5	2%	4	1%	5	2%	32	10%	14	5%	42	14%	115	37%	137	44%
52	56	setup Burke twin mill		295	95%	1	0%	2	1%	4	1%	8	3%	9	3%	28	9%	113	37%	157	51%
54	58	setup multiple spindl		272ERRO		4ERRO		1ERROERRORERROR				25ERRO		17	6%	23	7%	118	38%	150	49%
55	59	setup automatic screw		264	85%	6	2%	0	0%	13	4%	27	9%	24	8%	24	8%	114	37%	146	47%
56	60	setup gear shaper		290	94%	4	1%	2	1%	1	0%	12	4%	7	2%	17	6%	120	39%	164	53%
77	81	oper.Sunnen precision		258	83%	13	4%	7	2%	10	3%	22	7%	34	11%	37	12%	97	32%	138	45%
98	102	oper.Heald borematic		276	89%	3	1%	1	0%	7	2%	22	7%	13	4%	28	9%	117	38%	146	48%
123	127	oper.DoAll Saw		213	69%	13	4%	6	2%	25	8%	51	17%	61	20%	53	17%	93	30%	101	33%
125	129	oper.Wagner saw		264	86%	9	3%	1	0%	9	3%	25	8%	24	8%	55	18%	115	37%	114	37%
127	131	oper.Anvill Mill		277	90%	3	1%	4	1%	6	2%	19	6%	20	7%	22	7%	116	38%	149	49%
128	132	oper.vertical brcache		256	83%	7	2%	3	1%	6	2%	35	11%	26	8%	36	12%	117	38%	128	42%
130	130	oper. BarberColeman		259	84%	6	2%	3	1%	8	3%	32	10%	20	6%	32	10%	116	38%	140	45%
130	134	oper.Burke twin mill		280	91%	4	1%		0%	7	2%	16	5%	19	6%	23	8%	121	40%	142	47%
132	136	oper.multiple spindle		274	89%	4	1%		0%	6	2%	23	7%	17	6%	35	11%	118	38%	138	45%
133	137	oper.automatic screw		256	83%	3	1%		0%	11	4%	39	13%	26	9%	40	13%	117	38%	122	40%
134	138	oper.gear shaper		282	92%	3	1%		0%	5	2%	17	6%	10	3%	32	11%	128	42%	134	44%
168	172	use dial bar gages	X	146	48%	21	7%		0%	71	23%	65	21%	131	43%	60	20%	55	18%	60	20%
8	12	setup Seike 3NE		270	89%	9	3%		0%	10	3%	16	5%	15	5%	38	12%	120	39%	135	44%
9	13	setup Seike 4NE		273	90%	9	3%		0%	8	3%	15	5%	16	5%	33	11%	123	40%	136	44%
10	14	setup Seike 4NEA		278	91%	9	3%		0%	8	3%	9	3%	14	5%	29	9%	128	42%	137	44%
15	19	setup Landis external		265	87%	9	3%		0%	16	5%	16	5%	28	9%	26	8%	109	36%	144	47%
16	20	setup Gardner disk		282	91%	7	2%		0%	9	3%	11	4%	12	4%	20	7%	126	41%	149	49%
18	22	setup Landis plunge		284	93%	2	1%		0%	11	4%	9	3%	17	6%	19	6%	114	37%	158	51%
19	23	setup Heald 271		280	92%	5	2%		0%	10	3%	9	3%	18	6%	20	6%	110	36%	160	52%
20	24	setup Heald 272plain		278	92%	3	1%		0%	9	3%	11	4%	17	6%	19	6%	113	37%	157	51%
21	25	setup Heald 272sizema		283	92%	4	1%		0%	10	3%	10	3%	15	5%	21	7%	114	37%	157	51%
22	26	setup Cincinnati 181		287	93%	7	2%		0%	5	2%	9	3%	12	4%	20	6%	119	39%	157	51%

ROSTER E SECTIONS ALL
SUMMARY

QUESTION # PT 1	QUESTION # PT 2	task	GEN'L KNLGE NEVER		<1/MO		3 MONTHLY		4 REGULARLY		5 IN PAST		1 CAN DO		2 W/HELP		3 SIMILAR		4 NEED TR NG	
			#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
23	27	setup external stepma	293	95%	5	2%		0%	3	1%	7	2%	8	3%	18	6%	121	39%	161	52%
24	28	setup standard Heald	279	91%	2	1%		0%	7	2%	19	6%	10	3%	27	9%	105	35%	157	53%
27	31	setup transfer machin	290	94%	2	1%		0%	4	1%	12	4%	7	2%	20	7%	124	41%	155	51%
30	34	setup 4-6 spindle	257	82%	6	2%		0%	4	1%	48	15%	33	11%	28	9%	111	37%	[illegible]	43%
31	35	setup hvy duty vertic	227	73%	13	4%		0%	8	3%	62	20%	40	13%	39	13%	108	35%	119	39%
32	36	setupradial drill	225	73%	10	3%		0%	13	4%	61	20%	49	16%	41	13%	108	35%	109	36%
33	37	setup NATCO	259	85%	5	2%		0%	7	2%	33	11%	25	8%	35	11%	119	39%	128	42%
34	38	setup 21'upright	215	70%	5	2%		0%	20	7%	67	22%	50	16%	38	12%	109	36%	110	36%
35	39	setup CNC vertical	274	90%	3	1%		0%	8	3%	21	7%	11	4%	20	7%	119	39%	154	50%
36	40	setup CNC horizontal	278	90%	4	1%		0%	7	2%	20	6%	8	3%	24	8%	118	39%	156	51%
37	41	setup Bridgeport hori	237	74%	8	3%		0%	19	6%	55	17%	53	17%	36	12%	96	31%	122	40%
38	42	setup CincinRise&Fall	270	87%	1	0%		0%	7	2%	31	10%	18	6%	30	10%	114	37%	146	47%
39	43	setup duplex twinhead	273	89%	5	2%		0%	8	3%	21	7%	19	6%	25	8%	111	36%	150	49%
40	44	setup Milwaukee	267	88%	4	1%		0%	8	3%	23	8%	25	8%	17	6%	106	35%	159	52%
41	45	setup J&L CNC chucker	277	90%	6	2%		0%	13	4%	13	4%	15	5%	12	4%	123	40%	155	51%
42	46	setup J&L CNC combi	284	93%	5	2%		0%	6	2%	12	4%	9	3%	17	6%	125	41%	156	51%
43	47	setup K&T 180	292	94%	5	2%		0%	5	2%	7	2%	8	3%	10	3%	114	37%	173	57%
50	54	setup horiz broaches	272	88%	5	2%		0%	4	1%	28	9%	14	5%	36	12%	116	38%	141	46%
53	57	setup engine lathe	223	73%	8	3%		0%	18	6%	58	19%	53	17%	32	10%	88	29%	134	44%
57	61	setup TBI lathe	290	94%	3	1%		0%	3	1%	12	4%	10	3%	18	6%	118	38%	161	52%
58	62	setup gun drill	255	84%	7	2%		0%	6	2%	37	12%	24	8%	33	11%	116	38%	135	44%
59	63	oper.stand end plate	255	83%	6	2%		0%	8	3%	39	13%	29	10%	39	13%	117	38%	119	39%
62	66	oper Seiki 3NE	247	81%	10	3%		0%	25	8%	24	8%	34	11%	33	11%	109	36%	131	43%
63	67	oper.Seiki 4NE	250	82%	9	3%		0%	22	7%	23	8%	31	10%	35	11%	108	35%	133	43%
64	68	oper.Seiki 4NEA	262	86%	9	3%		0%	17	6%	17	6%	21	8%	37	14%	78	28%	138	50%
71	75	oper Hobb machine	265	87%	7	2%		0%	17	6%	17	6%	27	9%	24	8%	105	35%	147	49%
80	84	oper.Jig Bore	279	91%	2	1%		0%	8	3%	18	6%	22	7%	24	8%	109	36%	152	50%
82	86	oper bench grinders	143	48%	12	4%		0%	61	20%	82	28%	96	31%	41	13%	77	25%	94	31%
83	87	oper. contour saw	262	85%	5	2%		0%	13	4%	29	9%	28	9%	34	11%	116	38%	128	42%
84	88	oper. cam grinder	287	94%	2	1%		0%	1	0%	16	5%	12	4%	20	6%	119	39%	157	51%
85	89	oper. Landis external	264	86%	9	3%		0%	12	4%	22	7%	30	10%	26	8%	107	35%	144	47%
86	90	oper Norton external	263	85%	8	3%		0%	11	4%	26	8%	32	10%	27	9%	105	34%	144	47%
87	91	oper. Gardner disk	286	93%	3	1%		0%	8	3%	12	4%	16	5%	25	8%	118	38%	149	48%
88	92	oper Cincinn thru fee	283	92%	6	2%		0%	7	2%	11	4%	13	4%	25	8%	118	38%	152	49%
89	93	oper.Landis plunge	286	93%	4	1%		0%	9	3%	9	3%	21	7%	19	6%	112	36%	155	50%
90	94	oper.Heald 271	277	91%	5	2%		0%	10	3%	12	4%	18	6%	24	8%	108	35%	157	51%
91	95	oper.Heald 272 plain	279	91%	4	1%		0%	10	3%	13	4%	18	6%	24	8%	110	36%	155	50%
92	96	oper.Heald 272sizemat	283	92%	3	1%		0%	9	3%	11	4%	18	6%	22	7%	111	36%	156	51%
93	97	oper. Cincin181	286	93%	5	2%		0%	6	2%	10	3%	14	5%	25	8%	100	34%	158	53%
94	98	oper.external stepmas	288	94%	4	1%		0%	6	2%	8	3%	9	3%	19	6%	123	40%	156	51%
95	99	oper.roll stamp	207	70%	13	4%		0%	17	6%	59	20%	52	17%	73	24%	92	30%	90	29%
96	100	oper.power press	198	65%	15	5%		0%	24	8%	68	22%	72	23%	61	20%	86	23%	88	29%
97	101	oper.standard Heald	273	89%	2	1%		0%	6	2%	26	8%	12	4%	32	11%	117	38%	143	47%
99	103	oper.transfer machine	285	92%	3	1%		0%	4	1%	18	6%	11	4%	23	9%	117	39%	147	49%
100	104	oper.Jones&Lamson ATL	264	86%	2	1%		0%	7	2%	33	11%	20	7%	31	10%	115	38%	139	46%
101	105	oper.Wheel & Brader	272	89%	4	1%		0%	4	1%	27	9%	23	8%	30	10%	124	41%	125	41%
102	106	oper.straightn press	226	75%	12	4%		0%	10	3%	55	18%	54	18%	48	16%	108	35%	97	32%

ROSTER E SECTIONS ALL
SUMMARY

QUESTION #			GEN'L					3		4		5		1		2		3		4	
			KNLGE	NEVER		>1/MO		MONTHLY		REGULARLY		IN PAST		CAN DO		W/HELP		SIMILAR		NEED TR'NG	
PT 1	PT 2	task		f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
103	107	oper. lapping machine		253	83%	8	3%		0%	8	3%	37	12%	40	13%	44	14%	103	34%	119	39%
104	108	oper heat treat furna		285	93%	2	1%		0%	6	2%	13	4%	7	2%	26	8%	111	36%	163	53%
105	109	oper.induction heat		284	93%	0	0%		0%	7	2%	14	5%	8	3%	24	8%	109	36%	165	54%
106	110	oper.4-6spindle		250	81%	4	1%		0%	5	2%	48	16%	34	11%	31	10%	120	39%	121	40%
107	111	oper.radial drill		216	70%	7	2%		0%	12	4%	72	23%	52	17%	56	18%	101	33%	98	32%
108	112	oper.NATCO multi		258	84%	5	2%		0%	4	1%	40	13%	34	11%	40	13%	113	37%	120	39%
109	113	oper.24'upright singl		215	71%	7	2%		0%	17	6%	65	21%	53	17%	44	14%	107	35%	104	34%
110	114	oper.OKATA CNC		283	92%	4	1%		0%	7	2%	12	4%	13	4%	23	7%	120	39%	151	49%
114	118	oper.Bridgeport verti		203	67%	12	4%		0%	27	9%	63	21%	61	20%	35	11%	99	32%	111	36%
115	119	oper Cincin Rise&Fall		261	85%	5	2%		0%	6	2%	36	12%	23	7%	40	13%	112	36%	133	43%
116	120	oper.duplex-twin		259	85%	6	2%		0%	8	3%	33	11%	24	8%	39	13%	100	33%	136	45%
117	121	oper Milwaukee		264	86%	6	2%		0%	9	3%	29	9%	27	9%	30	10%	108	35%	143	46%
118	122	oper. J&L CNC chucker		264	86%	8	3%		0%	14	5%	21	7%	25	8%	25	8%	114	37%	142	46%
119	123	oper.J&L CNC combi		278	90%	8	3%		0%	9	3%	13	4%	16	5%	25	8%	119	39%	147	48%
120	124	oper Shaffner		276	91%	4	1%		0%	13	4%	10	3%	15	5%	23	7%	117	38%	152	50%
121	125	oper. oper K&T 180		283	92%	5	2%		0%	9	3%	10	3%	13	4%	20	6%	110	35%	173	55%
124	128	oper.Marvel saw		266	86%	9	3%		0%	9	3%	25	8%	26	8%	54	18%	112	36%	116	38%
131	135	oper. Vibro machine		252	82%	8	3%		0%	20	7%	26	8%	35	11%	54	18%	120	39%	97	32%
135	139	oper.barrel machine		283	92%	2	1%		0%	4	1%	20	6%	12	4%	54	18%	133	44%	105	35%
136	140	oper.big wash		260	84%	4	1%		0%	9	3%	36	12%	29	10%	73	24%	129	43%	72	24%
137	141	oper.derust wash		260	84%	3	1%		0%	9	3%	36	12%	29	9%	77	25%	131	43%	70	23%
138	142	oper.paint booth		251	81%	7	2%		0%	8	3%	43	14%	30	10%	81	26%	122	40%	74	24%
139	143	oper.powder coating		286	93%	4	1%		0%	5	2%	14	5%	11	4%	76	25%	134	44%	86	28%
140	144	oper.spin finish		285	92%	3	1%		0%	2	1%	19	6%	10	3%	65	21%	137	45%	95	31%
141	145	oper.buffing lathe		272	89%	3	1%		0%	2	1%	29	9%	20	7%	60	20%	134	44%	91	30%
142	146	oper. disc sander		212	70%	13	4%		0%	10	3%	69	23%	64	21%	63	21%	105	34%	75	24%
143	147	oper.float sander		262	86%	5	2%		0%	5	2%	34	11%	33	11%	71	23%	116	38%	86	29%
144	148	oper.belt sandner		141	47%	16	5%		0%	45	15%	99	33%	101	33%	65	21%	83	27%	57	19%
151	155	read Height&flatness	X	93	31%	13	4%		0%	142	47%	52	17%	195	64%	41	13%	31	10%	39	13%
153	157	maintain crib service	X	181	60%	15	5%		0%	54	18%	54	18%	142	46%	70	23%	57	19%	37	12%
154	158	maintain tool invento	X	148	49%	21	7%		0%	69	23%	61	20%	148	48%	64	21%	58	19%	36	12%
163	167	asasemble components	X	137	46%	11	4%		0%	89	30%	63	21%	139	46%	71	23%	58	19%	37	12%
164	168	oper.robot cell		268	89%	1	0%		0%	12	4%	19	6%	38	12%	72	23%	97	32%	100	33%
165	169	stamp ID on part		144	49%	12	4%		0%	60	20%	79	27%	152	50%	73	24%	47	15%	32	11%
167	171	assemble 2 or more pa		93	31%	13	4%		0%	99	33%	96	32%	194	64%	51	17%	33	11%	27	9%
170	174	oper. furnace		275	90%	3	1%		0%	8	3%	18	6%	15	5%	39	13%	122	40%	130	42%
171	175	use Rockwell hardness		241	78%	11	4%		0%	13	4%	43	14%	40	13%	61	20%	103	34%	102	33%
172	176	oper. black oxide		293	96%	0	0%		0%	4	1%	9	3%	14	5%	39	13%	125	41%	127	42%
173	177	oper forge furnace		298	97%	2	1%		0%	2	1%	5	2%	7	2%	35	11%	128	42%	135	44%
175	179	oper.upset hammer		296	96%	3	1%		0%	1	0%	7	2%	11	4%	35	12%	127	42%	131	43%
176	180	oper. Richard's bende		290	95%	4	1%		0%	2	1%	10	3%	10	3%	37	12%	121	40%	134	44%
177	181	sharpen drills	X	130	45%	19	7%		0%	59	20%	83	29%	130	43%	63	21%	52	17%	59	19%
191	196	assist w/repair		123	41%	25	8%		0%	98	33%	52	17%	164	54%	52	17%	47	16%	39	13%
192	196	assist w/troubleshoot		62	21%	24	8%		0%	162	55%	46	16%	207	68%	42	14%	25	8%	30	10%

WORKER SELF-ASSESSMENT

PART I

FOR INGERSOLL-RAND

AUGUST 3-4,1987

Part I

This is a "Worker Self Assessment". It is designed to help us learn more about what you do on the job and to tell us how you feel about your abilities. This is NOT a test. There are no 'right' or 'wrong' answers. There is no time limit; you have as much time as you need to respond to the items presented.

Darken in the "0" on the RED answer sheet which corresponds to your response.

Make only ONE (1) response per item.

Use only a No.2 lead pencil.

Make no stray marks on your response sheet.

If you wish to change your response, erase your original response completely.

1. Number of years employed by Ingersoll-Rand
   - A. less that 5 years
   - B. 5 - 10 years
   - C. 11-15 years
   - D. 16 - 20 years
   - E. 21 - 25 years
   - F. over 25 years

2. Number of years within your present department
   - A. one or less
   - B. two
   - C. three
   - D. four
   - E. five or more

3. Have you ever been a supervisor/foreman for Ingersoll-Rand?
   - A. yes
   - B. no

4. Have you ever been a supervisor/foreman for another employer?
   - A. yes
   - B. no

5. Do you have any skills required by Ingersoll-Rand which you do not use during the normal course of your job?
   - A. yes
   - B. no

6. Have you held similar positions to the one which you have now prior to coming to work for Ingersoll-Rand?
   - A. yes
   - B. no

7. On which Master Roster are you currently working?
   - A. Machining
   - B. Non-machining
   - C. Skilled machining
   - D. Skilled trades

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST.

Set-up:

8. Seiki 3NE CNC lathe 1 2 3 4 5
9. Seike 4NE CNC lathe 1 2 3 4 5
10. Seike 4NEA CNC lathe 1 2 3 4 5
11. standard end plate finishing lathe 1 2 3 4 5
12. drill press 1 2 3 4 5
13. Bridgeport milling machine 1 2 3 4 5
14. Sunnen horizontal hone 1 2 3 4 5
15. Landis external grinder 1 2 3 4 5
16. Gardner disk grinder horizontal 1 2 3 4 5
17. Cincinnati thru feed griinder 1 2 3 4 5
18. Landis plunge drive grinder 1 2 3 4 5
19. Heald model 271 grinder 1 2 3 4 5
20. Heald model 272 plain grinder 1 2 3 4 5
21. Heald model 272 sizematic grinder 1 2 3 4 5
22. Cincinnati model 181 grinder 1 2 3 4 5
23. external stepmaster grinder 1 2 3 4 5

Set-up:

24. standard Heald borematic 1 2 3 4 5
25. Heald borematic pin machine 1 2 3 4 5
26. horizontal turret lathe 1 2 3 4 5
27. transfer machine 1 2 3 4 5
28. Potter & Johnson chucking lathe 1 2 3 4 5
29. Warner Swazy AC lathe 1 2 3 4 5
30. 4-6 spindle gang drill 1 2 3 4 5
31. heavy duty vertical drilling 1 2 3 4 5
machine 1 2 3 4 5
32. radial drill press 1 2 3 4 5
33. NATCO multi-spindle drill press 1 2 3 4 5
34. 21" upright single spindle drill press 1 2 3 4 5
35. CNC vertical machining center 1 2 3 4 5
36. CNC horizontal maching center 1 2 3 4 5
37. Bridgeport horizontal milling machine 1 2 3 4 5
38. Cincinnati rise & fall 1 2 3 4 5

1. **NEVER**
2. **LESS THAN ONCE A MONTH**
3. **ONCE A MONTH**
4. **REGULARLY**
5. **MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST.**

Set-up:

39. duplex-twin head milling machine 1 2 3 4 5
40. Milwaukee matic EB 1 2 3 4 5
41. J & L CNC chucker, A line 1 2 3 4 5
42. J & L CNC combi-lathe 1 2 3 4 5
43. KT 180 1 2 3 4 5
44. Scimmx 1 2 3 4 5
45. Do All saw 1 2 3 4 5
46. Wagner saw 1 2 3 4 5
47. Barber Coleman Hobb-gear making machine 1 2 3 4 5
48. anvill mills 1 2 3 4 5
49. vertical broaches 1 2 3 4 5
50. horizontal broaches 1 2 3 4 5
51. MSO machine 1 2 3 4 5
52. Burke twin mill 1 2 3 4 5
53. engine lathe 1 2 3 4 5

Set-up:

54. multiple spindle screw machine 1 2 3 4 5
55. automatic screw machines 1 2 3 4 5
56. gear shaper 1 2 3 4 5
57. TBI lathe 1 2 3 4 5
58. gun drill 1 2 3 4 5

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IS IN THE PAST

Operate:

59. standard end plate finishing lathe 1 2 3 4 5
60. drill press 1 2 3 4 5
61. Bridgeport mill 1 2 3 4 5
62. Seiki 3NE automatic turret lathe 1 2 3 4 5
63. Seiki 4NE automatic turret lathe 1 2 3 4 5
64. Seiki 4NEA automatic turret lathe 1 2 3 4 5
65. Sunnen horizontal hone 1 2 3 4 5
66. Cincinnati monoset tool grinder 1 2 3 4 5
67. Heald tool grinding machine 1 2 3 4 5
68. Norton surface grinder 1 2 3 4 5
69. drill grinder 1 2 3 4 5
70. surface grinder 1 2 3 4 5
71. Hobb machine 1 2 3 4 5
72. cutter and tool grinding machine 1 2 3 4 5
73. tap grinder 1 2 3 4 5
74. thread chaser 1 2 3 4 5
75. Gleason cutter-shaper 1 2 3 4 5
76. single point carbide grinder 1 2 3 4 5
77. Sunnen precision honing machine 1 2 3 4 5
78. milling machines 1 2 3 4 5
79. lathe 1 2 3 4 5
80. jig bore 1 2 3 4 5
81. surface grinder 1 2 3 4 5

Operate:

82. bench grinders 1 2 3 4 5
83. contour saw 1 2 3 4 5
84. cam grinder 1 2 3 4 5
85. Landis external grinder 1 2 3 4 5
86. Norton external grinde 1 2 3 4 5
87. Gardner disk grinder horizontal 1 2 3 4 5
88. Cincinnati thru feed grinder 1 2 3 4 5
89. Landis plunge drive grinder 1 2 3 4 5
90. Heald model 271 grinder 1 2 3 4 5
91. Heald model 272 plain grinder 1 2 3 4 5
92. Heald model 272 sizematic grinder 1 2 3 4 5
93. Cincinnati model 181 grinder 1 2 3 4 5
94. external stepmaster grinder 1 2 3 4 5
95. roll stamp 1 2 3 4 5
96. power press 1 2 3 4 5
97. standard Heald borematic 1 2 3 4 5
98. Heald borematic pin machine 1 2 3 4 5
99. transfer machine 1 2 3 4 5
100. Jones & Lamson ATL 1 2 3 4 5
101. Wheel & Brader shot-blast machine 1 2 3 4 5
102. straightening press 1 2 3 4 5
103. lapping machine 1 2 3 4 5
104. heat treat furnaces 1 2 3 4 5
105. induction heat treat machine 1 2 3 4 5

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IS IN THE PAST

Operate:

106. 4-6 spindle gang drill 1 2 3 4 5
107. radial drill press 1 2 3 4 5
108. NATCO multi-spindle drill press 1 2 3 4 5
109. 24" upright single spindle drill press 1 2 3 4 5
110. Okata CNC milling machine 1 2 3 4 5
111. Bridgeport CNC milling machine 1 2 3 4 5
112. Cincinnati horizontal milling machine 1 2 3 4 5
113. Cincinnati vertical milling machine 1 2 3 4 5
114. Bridgeport Vertical milling machine 1 2 3 4 5
115. Cincinnati rise and fall 1 2 3 4 5
116. duplex-twin mill machine 1 2 3 4 5
117. Milwaukee-matic EB 1 2 3 4 5
118. J & L CNC chucker , A line 1 2 3 4 5
119. J & L CNC combi lathe 1 2 3 4 5
120. Shaffner rise & fall 1 2 3 4 5
121. K & T 180 1 2 3 4 5
122. Scimmx 1 2 3 4 5
123. Do All saw 1 2 3 4 5
124. Marvel saw 1 2 3 4 5
125. Wagner saw 1 2 3 4 5

Operate:

126. Barber Coleman hobb-gear making machine 1 2 3 4 5
127. Anvill mill 1 2 3 4 5
128. vertical broaches 1 2 3 4 5
129. MSO machine 1 2 3 4 5
130. Burke twin mill 1 2 3 4 5
131. vibro machine 1 2 3 4 5
132. multiple spindle screw machine1 2 3 4 5
133. automatic screw machine 1 2 3 4 5
134. gear shaper 1 2 3 4 5
135. barrel machine tumbler 1 2 3 4 5
136. big wash 1 2 3 4 5
137. derust wash 1 2 3 4 5
138. paint booth 1 2 3 4 5
139. powder coating 1 2 3 4 5
140. spin finish machine 1 2 3 4 5
141. buffing lathe 1 2 3 4 5
142. disc sander 1 2 3 4 5
143. float sander 1 2 3 4 5
144. belt sander 1 2 3 4 5

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST

I do the following:

145. read blue prints 1 2 3 4 5
146. read micrometers 1 2 3 4 5
147. read concentricity gages 1 2 3 4 5
148. read plug gages 1 2 3 4 5
149. measure up to .0001" 1 2 3 4 5
150. measure up to 1/64" 1 2 3 4 5
151. read height and flatness gages 1 2 3 4 5
152. use basic math skills 1 2 3 4 5
153. maintain crib service 1 2 3 4 5
154. maintain inventory of tools 1 2 3 4 5
155. use Vernier calipers 1 2 3 4 5
156. use Johannson blocks 1 2 3 4 5
157. use Machinist Handbook 1 2 3 4 5
158. use trigonometry 1 2 3 4 5
159. read complicated prints and drawings 1 2 3 4 5
160. use depth gages 1 2 3 4 5
161. use shadow gages 1 2 3 4 5
162. use radius gages 1 2 3 4 5
163. assemble components for tools 1 2 3 4 5
164. operate automated test cell 1 2 3 4 5
165. stamp identification number on parts 1 2 3 4 5
166. read WIP forms 1 2 3 4 5
167. assemble two or more parts 1 2 3 4 5

I do the following:

168. use dial bore gages 1 2 3 4 5
169. use dial depth gages 1 2 3 4 5
170. operate furnace 1 2 3 4 5
171. use Rockwell hardness tester 1 2 3 4 5
172. operate black oxide line 1 2 3 4 5
173. operate forge furnace 1 2 3 4 5
174. use slip gages 1 2 3 4 5
175. operate upset hammer 1 2 3 4 5
176. operate Richard's bender 1 2 3 4 5
177. sharpen drills 1 2 3 4 5
178. read Machinist's handbook 1 2 3 4 5
179. adjust the machine which I operate 1 2 3 4 5
180. load/unload the machine which I operate 1 2 3 4 5
181. obtain the tools/tooling for my job 1 2 3 4 5
182. clean, oil, lubricate the machine(s) which I operate 1 2 3 4 5
183. assist with maintainence of the machine which I operate 1 2 3 4 5
184. load a tape in a NC machine 1 2 3 4 5
185. arrange for the servicing of the machine which I operate 1 2 3 4 5
186. check part to print 1 2 3 4 5

1. NEVER
2. LESS THAN ONCE A MONTH
3. ONCE A MONTH
4. REGULARLY
5. MY JOB DOES NOT PRESENTLY REQUIRE THIS BUT I HAVE DONE THIS IN THE PAST

I do the following:

187. program the machine which I operate 1 2 3 4 5
188. mount material in fixture/collet 1 2 3 4 5
189. change fixture/collet 1 2 3 4 5
190. assist in trouble shooting or solving problems relating to my job/machine 1 2 3 4 5
191. assist with the repair of the machine(s) which I operate 1 2 3 4 5
192. assist co-workers solve problems or trouble shoot problems relating to their job(s) 1 2 3 4 5

WORKER SELF-ASSESSMENT

PART II

FOR INGERSOLL-RAND

AUGUST 3-4,1987

Part II

This is a "Worker Self Assessment". It is designed to help us learn more about what you do on the job and to tell us how you feel about your abilities. This is NOT a test. There are no 'right' or 'wrong' answers. There is no time limit; you have as much time as you need to respond to the items presented.

Darken in the "0" on the BLUE answer sheet which corresponds to your response.

Make only ONE (1) response per item.

Use only a No.2 lead pencil.

Make no stray marks on your response sheet.

If you wish to change your response, erase your original response completely.

In which areas would you like more training:

1. reading A. yes B. no
2. basic math A. yes B. no
3. algebra A. yes B. no
4. trig and advanced math A. yes B. no
5. blue print reading A. yes B. no
6. blue print drawing A. yes B. no
7. conventional machine operations A. yes B. no
8. CNC machine operations A. yes B. no
9. machine shop practices A. yes B. no
10. quality control procedures A. yes B. no

11. On which Master Roster are you currently working?
    A. Machining
    B. Non-machining
    C. Skilled machining
    D. Skilled trades

1. **I can perform this task without supervision or assistance.**
2. **I could perform this task with very little assistance from my supervisor or co-worker.**
3. **I have not done this task before but I could do it with a reasonable amount of assistance or instruction.**
4. **I do not yet have the competencies or skills to perform this task and would need formal training or instruction.**

Set-up:

12. Seiki 3NE CNC lathe	1 2 3 4
13. Seike 4NE CNC lathe	1 2 3 4
14. Seike 4NEA CNC lathe	1 2 3 4
15. standard end plate finishing lathe	1 2 3 4
16. drill press	1 2 3 4
17. Bridgeport milling machine	1 2 3 4
18. Sunnen horizontal hone	1 2 3 4
19. Landis external grinder	1 2 3 4
20. Gardner disk grinder horizontal	1 2 3 4
21. Cincinnati thru feed grinder	1 2 3 4
22. Landis plunge drive grinder	1 2 3 4
23. Heald model 271 grinder	1 2 3 4
24. Heald model 272 plain grinder	1 2 3 4
25. Heald model 272 sizematic grinder	1 2 3 4
26. Cincinnati model 181 grinder	1 2 3 4
27. external stepmaster grinder	1 2 3 4

Set-up:

28. standard Heald borematic	1 2 3 4
29. Heald borematic pin machine	1 2 3 4
30. horizontal turret lathe	1 2 3 4
31. transfer machine	1 2 3 4
32.. Potter & Johnson chucking lathe	1 2 3 4
33. Warner Swazy AC lathe	1 2 3 4
34. 4-6 spindle gang drill	1 2 3 4
35. heavy duty vertical drilling machine	1 2 3 4
36. radial drill press	1 2 3 4
37. NATCO multi-spindle drill press	1 2 3 4
38. 21" upright single spindle	1 2 3 4
drill press	1 2 3 4
39. CNC vertical machining center	1 2 3 4
40 CNC horizontal maching center	1 2 3 4
41. Bridgeport horizontal milling machine	1 2 3 4
42. Cincinnati rise & fall	1 2 3 4

1. I can perform this task without supervision or assistance.

2. I could perform this task with very little assistance from my supervisor or co-worker.

3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.

4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

Set-up:

43. duplex-twin head milling machine 1 2 3 4
44. Milwaukee-matic EB 1 2 3 4
45. J & L CNC chucker, A line 1 2 3 4
46. J & L CNC combi-lathe 1 2 3 4
47. KT 180 1 2 3 4
48. Scimmx 1 2 3 4
49. Do All saw 1 2 3 4
50. Wagner saw 1 2 3 4
51. Barber Coleman Hobb-gear making machine 1 2 3 4
52. anvill mills 1 2 3 4
53. vertical broaches 1 2 3 4
54. horizontal broache 1 2 3 4
55. MSO machine 1 2 3 4
56. Burke twin mill 1 2 3 4
57. engine lathe 1 2 3 4

Set-up:

58. multiple spindle screw machine 1 2 3 4
59. automatic screw machines 1 2 3 4
60. gear shaper 1 2 3 4
61. TBI lathe 1 2 3 4
62. gun drill 1 2 3 4

1. I can perform this task without supervision or assistance.

2. I could perform this task with very little assistance from my supervisor or co-worker.

3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.

4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

Operate:

63. standard end plate finishing lathe	1	2	3	4
64. drill press	1	2	3	4
65. Bridgeport mill	1	2	3	4
66. Seiki 3NE automatic turret lathe	1	2	3	4
67. Seiki 4NE automatic turret lathe	1	2	3	4
68. Seiki 4NEA automatic turret lathe	1	2	3	4
69. Sunnen horizontal hone	1	2	3	4
70. Cincinnati monosett tool grinder	1	2	3	4
71. Heald tool grinding machine	1	2	3	4
72. Norton surface grinder	1	2	3	4
73. drill grinder	1	2	3	4
74. surface grinder	1	2	3	4
75. Hobb machine	1	2	3	4
76. cutter and tool grinding machine	1	2	3	4
77. tap grinder	1	2	3	4
78. thread chaser	1	2	3	4
79. Gleason cutter-shaper	1	2	3	4
80. single point carbide grinder	1	2	3	4
81. Sunnen precision honing machine	1	2	3	4

Operate:

82. milling machines	1	2	3	4
83. lathe	1	2	3	4
84. jig bore	1	2	3	4
85. surface grinder	1	2	3	4
86. bench grinders	1	2	3	4
87. contour saw	1	2	3	4
88. cam grinder	1	2	3	4
89. Landis external grinder	1	2	3	4
90. Norton external grinder	1	2	3	4
91. Gardner disk grinder horizontal	1	2	3	4
92. Cincinnati thru feed grinder	1	2	3	4
93. Landis plunge drive grinder	1	2	3	4
94. Heald model 271 grinder	1	2	3	4
95. Heald model 272 plain grinder	1	2	3	4
96. Heald model 272 sizematic grinder	1	2	3	4
97. Cincinnati model 181 grinder	1	2	3	4
98. external stepmaster grinder	1	2	3	4
99. roll stamp	1	2	3	4
100. power press	1	2	3	4

1. I can perform this task without supervision or assistance.
2. I could perform this task with very little assistance from my supervisor or co-worker.
3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.
4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

Operate:

101. standard Heald borematic	1	2	3	4
102. Heald borematic pin machine	1	2	3	4
103. transfer machine	1	2	3	4
104. Jones & Lamson ATL	1	2	3	4
105. Wheel & Brader shot-blast machine	1	2	3	4
106. straightening press	1	2	3	4
107. lapping machine	1	2	3	4
108. heat treat furnaces	1	2	3	4
109. induction heat treat machine	1	2	3	4
110. 4-6 spindle gang drill	1	2	3	4
111. radial drill press	1	2	3	4
112. NATCO multi-spindle drill press	1	2	3	4
113. 24" upright single spindle drill press	1	2	3	4
114. Okata CNC milling machine	1	2	3	4
115. Bridgeport CNC milling machine	1	2	3	4
116. Cincinnati horizontal milling machine	1	2	3	4
117. Cincinnati vertical milling machine	1	2	3	4
118. Bridgeport Vertical milling machine	1	2	3	4
119. Cincinnati rise and fall	1	2	3	4

Operate:

120. duplex-twin mill machine	1	2	3	4
121. Milwaukee-matic EB	1	2	3	4
122. J & L CNC chucker , A line	1	2	3	4
123. J & L CNC combi lathe	1	2	3	4
124. Shaffner rise & fall	1	2	3	4
125. K & T 180	1	2	3	4
126. Scimmx	1	2	3	4
127. Do All saw	1	2	3	4
128. Marvel saw	1	2	3	4
129. Wagner saw	1	2	3	4
130. Barber Coleman hobb-gear making machine	1	2	3	4
131. Anvill mill	1	2	3	4
132. vertical broaches	1	2	3	4
133. MSO machine	1	2	3	4
134. Burke twin mill	1	2	3	4
135. vibro machine	1	2	3	4
136. multiple spindle screw machine	1	2	3	4

1. I can perform this task without supervision or assistance.

2. I could perform this task with very little assistance from my supervisor or co-worker.

3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.

4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

Operate

137. automatic screw machine	1	2	3	4
138. gear shaper	1	2	3	4
139. barrel machine tumbler	1	2	3	4
140. big wash	1	2	3	4
141. derust wash	1	2	3	4
142. paint booth	1	2	3	4
143. powder coating	1	2	3	4
144. spin finish machine	1	2	3	4
145. buffing lathe	1	2	3	4
146. disc sander	1	2	3	4
147. float sander	1	2	3	4
148. belt sander	1	2	3	4

1. I can perform this task without supervision or assistance.

2. I could perform this task with very little assistance from my supervisor or co-worker.

3. I have not done this task before but I could do it with a reasonable amount of assistance or instruction.

4. I do not yet have the competencies or skills to perform this task and would need formal training or instruction.

149. read blue prints 1 2 3 4
150. read micrometers 1 2 3 4
151. read concentricity gages 1 2 3 4
152. read plug gages 1 2 3 4
153. measure up to .0001" 1 2 3 4
154. measure up to 1/64" 1 2 3 4
155. read height and flatness gages 1 2 3 4
156. use basic math skills 1 2 3 4
157. maintain crib service 1 2 3 4
158. maintain inventory of tools 1 2 3 4
159. use Vernier calipers 1 2 3 4
160. use Johannson blocks 1 2 3 4
161. use Machinist Handbook 1 2 3 4
162. use trigonometry 1 2 3 4
163. read complicated prints and drawings 1 2 3 4
164. use depth gages 1 2 3 4
165. use shadow gages 1 2 3 4
166. use radius gages 1 2 3 4
167. assemble components for tools 1 2 3 4
168. operate automated test cell 1 2 3 4
169. stamp identification number on parts 1 2 3 4
170. read WIP forms 1 2 3 4
171. assemble two or more parts 1 2 3 4
172. use dial bar gages 1 2 3 4
173. use dial depth gages 1 2 3 4
174. operate furnce 1 2 3 4
175. use Rockwell hardness tester 1 2 3 4
176. operate black oxide line 1 2 3 4
177. operate forge furnace 1 2 3 4
178. use slip gages 1 2 3 4
179. operate upset hammer 1 2 3 4
180. operate Richard's bender 1 2 3 4
181. sharpen drills 1 2 3 4
182. read Machinist's handbook 1 2 3 4
183. adjust the machine which I operate 1 2 3 4
184. load/unload the machine which I operate 1 2 3 4
185. read a print for the part I am working on 1 2 3 4

1. **I can perform this task without supervision or assistance.**
2. **I could perform this task with very little assistance from my supervisor or co-worker.**
3. **I have not done this task before but I could do it with a reasonable amount of assistance or instruction.**
4. **I do not yet have the competencies or skills to perform this task and would need formal training or instruction.**

186. obtain the tools/tooling for my job 1 2 3 4
187. clean, oil, lubricate the machines which I operate 1 2 3 4
188. assist with maintainence of the machine which I operate 1 2 3 4
189. load a tape in a NC machine 1 2 3 4
190. arrange for the servicing of a machine 1 2 3 4
191. check part to print 1 2 3 4
192. program the machine which I operate 1 2 3 4
193. mount material in fixture/collet 1 2 3 4
194. change fixture/collet 1 2 3 4
195. assist in trouble shooting or solving probelms relating to my job/machine 1 2 3 4
196. assist with the repair of the machine(s) which I operate 1 2 3 4
197. assist co-workers solve problems or trouble shoot problems relating their job(s) 1 2 3 4